John Cranford,
M. D.

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THE

MEDICAL REPOSITORY.

Vol. I.—No. I.

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PREFACE.

THE *firſt Number* of the MEDICAL REPOSITORY makes its appearance under many diſadvantages. It was the original intention of the Publiſhers not to have committed it to the preſs, till communications from various parts of the United States ſhould enable them to offer an example of that method which they have traced in their *Circular Addreſs*. But it was diſcovered, that a longer time than had been expected, either by their correſpondents or themſelves, was eſſential to the due arrangement of the proper materials; and the delay, thus unavoidably occaſioned, led many, even of their friends, to ſuppoſe they had relinquiſhed their deſign. In this ſituation, it became neceſſary for them to haſten their firſt publication, that they might encourage exertions in others by this pledge of their own perſeverance. The preſent Number, of conſequence, conſiſts, almoſt excluſively, of papers furniſhed by themſelves: a circumſtance which the induſtry of many reſpectable correſpondents, (and particularly ſeveral valuable communications, received as the laſt ſheet of this Number was printing off,) encourage them to believe will not occur in future.

After this explanation of the cauſes of the imperfections of the publication now made, it may not be improper to add a few words on what may be deemed the recommendations of the plan of the Compilers to general patronage.

The zeal and activity with which medical improvements are proſecuted in Europe, is faſt ſpreading in America; and if, hitherto, our profeſſors of the healing art have been behind other profeſſional men in ſcience and induſtry, it may ſafely be

predicted, that this will not long continue their reproach. But various causes will probably, for some time, prevent them from appearing extensively, as authors. And as medical and other scientific associations have been but partially attempted in the several States, and where they have been, have not appeared to flourish with much vigour, a considerable period must elapse before a different kind of publication, from the present, will be so generally convenient and useful as the depositary of facts and reasonings relative to Natural History, Agriculture, and Medicine.—Should these considerations determine men of industry and learning, in different parts of our country, to encourage it, it will be obvious, from the smallness of the type, the fullness of the page, and the moderate price at which it is afforded, that an equal portion of valuable information can no where be so easily procured. This circumstance, though it may be undervalued by those who reside in our principal towns, who have the means of purchasing, and the opportunities of consulting, large collections of books, will not fail to be duly appreciated by professional men, in general.—The art of book-making, as it is now practised in Europe, and especially in Great-Britain, with the increasing necessity for books, and the increasing charges upon them, must leave men of moderate fortunes in absolute despair of forming any considerable library of medical works. The periodical publications alone, where a short paper is often expanded through twenty pages, when it might be compressed in half the number, amount to an expence that few are able to bear. The effect of this is to restrain the course of knowledge, and exclude the hope of improvement, except by the most tedious and imperfect of all processes. But, for this evil, a remedy will be provided in the MEDICAL REPOSITORY, should it meet with success.—In addition to the original contents of each Number, it is intended to re-publish, in an Appendix, the best papers, connected with the plan of the Work, which have appeared, and shall, from time to time, appear in the United States and in Europe. Those materials which our own country will afford for this part of the Repository, will

probably be ſoon expended; but Europe offers an inexhauſtible fund; and it is evident that, with the power of ſelection, this publication may vie with any of the foreign Journals. This will be better underſtood when it is obſerved, that from the difference in the mode of printing, a hundred pages of the Repoſitory will comprehend not leſs than three hundred of any ſimilar work in Great-Britain, and at one fourth of the expence; and thus, the Appendix alone may be made to contain a volume of the ſize of the Medical Commentaries, Medical Memoirs, &c. &c.—The frequency of publication, likewiſe, will give the Repoſitory a manifeſt ſuperiority over moſt works of the ſame kind, in the opportunity it affords of ſpeedily circulating new improvements and diſcoveries; while an extenſive correſpondence, forming, or already eſtabliſhed, in various parts of Europe and America, will enable the Publiſhers, at the ſame time, to communicate the earlieſt and moſt authentic American information, to Europe; and the lateſt labours of the learned in Great-Britain, France, Germany, Italy, Sweden, &c. to America.—Time, it is true, will be neceſſary for the complete eſtabliſhment of this part of the undertaking; but of this eſtabliſhment, with the countenance of their fellow citizens, the Publiſhers entertain no doubt. The ill-ſucceſs of former attempts is all that excites any apprehenſion in their boſoms, for the fate of the preſent. But they rely on the conſiderate good ſenſe of the public, and encourage brighter expectations.

New-York, July 26, 1797.

☞ *SINCE the Eſſay on the* PLAGUE OF ATHENS *was printed off, I have been able to obtain the paſſage of* HALLER, *from which, on the authority of* DE PAUW, *I had ventured to aſſert, that the illuſtrious Swiſs conſidered that diſeaſe as an ordinary contagious fever.—See* p. 20 *of the Repoſitory.—This aſſertion is not correct—though the difference is not material to the argument.—*HALLER's *opinion is expreſt negatively, in the following words:—*" Non " putes veri nominis peſtem fuiſſe."—*Biblioth. Med. Pract.* tom. i. p. 102.—*The whole paſſage is too long to be quoted in this place.*

S.

CIRCULAR ADDRESS.

AFTER a continued struggle of many centuries, against the absurd systems of ancient physicians, and amid the difficulties repeatedly opposed to the progress of Medicine by modern hypotheses scarcely less preposterous, it has at length become established as a fundamental truth, that though conjecture may precede experiment, facts are the only rational basis of theory. Philosophers are no longer permitted to descend from generals to particulars, shaping them according to preconceived notions of their intimate relations; but are expected to proceed by a rigid examination and cautious assemblage of particulars to every general inference. This laborious process of reasoning, so favourable to truth, and so little flattering to indolence, to vanity, and to a creative fancy, requires the possession of an extensive mass of experiment, a various and judicious selection of facts;—not only for him who would overthow or construct a system, but for every one who would rightly exercise the art to which they belong. And in proportion as these sentiments have gained ground among physicians, Systems of Physic have lost much of their value; and Collections of Histories and Observations, whether the work of a single, or of many hands, have gradually obtained a high consideration and authority in the schools of medicine, as well as in the closets of practitioners. For, whatever advantages may have been temporarily derived from certain celebrated theories, it is chiefly by the new spring which they have given to the mind, and by the more accurate investigation of natural phenomena to which they have excited others, that they have been permanently useful. For our knowledge of nature is too limited, our collection of materials too scanty, to enable even the most diligent and ingenious to frame a correct theory. Medical collections, therefore, are still necessary, and must long continue to be so; and as they are free from the incumbrance of systematized hypothesis, the opinions they contain, for the most part, spring more naturally out of the facts on which they are founded, are thus less likely to mislead, and even though erroneous, as they maintain no intimate connection with an extensive scheme, still leave us, in the facts themselves, the surest guides amidst the intricacies of practice. Publications of this kind, likewise, from their very nature, possess many

advantages over systematic works. They employ a greater number of observers, over a wider field, admit of minuter details, ampler discussions, and more various opinions and recondite investigations. By their instrumentality, facts are preserved or rescued from oblivion, which, without them, had been wholly lost: for there are few men who find leisure and inclination, from the pressure of daily business, to become authors, and still fewer whose observations are so numerous and important as to demand a laboured treatise; while there are many who have time and facts to furnish out, almost every year of their lives, a short but valuable essay. And if to these arguments, in favour of Medical Collections, drawn from the nature of the works, it may be permitted to add others from the practice of other nations than our own, the example of almost every civilized country of Europe may be cited; in which publications of this kind are successfully multiplied, and sought after with peculiar avidity. But, notwithstanding the many obvious benefits resulting from them, such undertakings, in the United States, have been few, and feebly prosecuted. And this is the more to be lamented, as no country in the world is so capable of giving permanent utility to such a design. For, beside those advantages which we possess in common with other nations, there are numerous others of new and peculiar importance. These exist in our extensive territory; in the variety of its soil, climate, elevation, and aspect; in the varied descent, population, intermixture, institutions, manners, and consequent diseases, of its inhabitants; in the opportunities it affords of observing and estimating the effects of old and new settlements, of gradual and rapid changes in the face of a country, of agriculture, commerce, and navigation, of the savage, civilized, and intermediate states of society; of comparing the diseases, or phenomena of each disease, and the operation of the same remedies, in the same or different complaints, in Europe and America; in the general diffusion of knowledge, and turn for observation, among all classes of its citizens; and, finally, in the sameness and perfection of their language—an advantage possessed in the same degree by no other people.—These are privileges which should prove so many powerful incentives to medical industry; which should inspirit the exertions of physicians to give that importance, in a professional view, to their country, which, fertile as she is in occasions, she loudly calls for at their hands.

The present time seems particularly favourable to such attempts. The distressing events which have been so recently witnessed, in various parts of our country, have awakened the curiosity of others, as well as of physcians; and while they have quickened the zeal and observation of the latter, have excited the eager apprehensions of all. This has created an uncommon interest, in respect to me-

dical opinions, among the people at large, and especially since the belief of the domestic origin of certain diseases has been considerably disseminated. The partial success of a late benevolent attempt, of the kind now referred to,* is rather encouraging than disheartening; since its failure is attributable to causes not necessarily connected with the design, and since there is good ground to believe, that a little perseverance would have given it stability and reputation.—To the success of such a publication, much time, as well as the concurrent exertions of many observers, were indispensable. The field of inquiry, likewise, was comparatively narrow; and too much reliance was, probably, placed on public solicitation, with so limited a time for the collection of materials.

Influenced by considerations, and invited by views, which we have now unfolded, and shall consequently enlarge upon, we have ventured to project a work such as we have recommended, and thus publicly to solicit your assistance in its execution. And we request you to furnish us, either quarterly, semi-annually, or annually, as may best suit with your convenience, with such information, relative to all or either of the following particulars, as may be in your power.

1. Histories of such diseases as reign in your particular places of residence, at each and every season of the year; including the time of their appearance and disappearance; the peculiar customs and manners, and food of the people; local peculiarities, (not merely those of the town or village, but of the immediate residence of the sick,) preceding, cotemporary, and subsequent complaints; symptoms, progress, extent, method of cure, mortality, and what proportion of either sex, and of different ages, are affected:—in sea-ports, attention to be paid to supposed sources of importation, and to the arrival of foreigners; in new settlements, to changes in the face of the country, by clearings, drainings, &c. and to the increase of population, by immigration and otherwise.
2. Histories of such diseases as appear among *Domestic Animals*—such as horses, cattle, sheep, &c—their causes, symptoms, method of cure, &c. &c.
3. Accounts of *Insects*—whether any uncommon dearth or numbers of them; whether troublesome or noxious to men, beasts, or vegetables; with as accurate and minute notices as may be of their derivation, mode of propagation, nature and extent of such ravages, or other evils, as they may occasion; of their appearance and disappearance, and of the means, if any, of guarding against or destroying them.
4. Histories of the progress and condition of *Vegetation*—with regard to growth, vigour, and disease; independent of the

* Mr. WEBSTER's Collection, relative to Bilious Fevers, &c.

ravages of insects; but marking the influence of manures, and the local situation, both as to elevation and soil, air and water.

5. The state of the *Atmosphere*—in respect to dryness and humidity, heat and cold, serenity and tempestuousness; including the direction and force of winds, and the sensible quantity of electricity.

Where information relative to these various topics of inquiry can be given in a connected form, it will be most acceptable; and the more minute and precise, the more useful will it be. But general and distinct communications are earnestly requested, where more extensive and combined intelligence cannot readily be afforded.

The outline now traced, gentlemen, will enable you to form some idea of the nature, extent, and importance of the work, in the prosecution of which we solicit your co-operation. The benefits which may result from such a publication, if vigorously and judiciously executed, are too numerous and considerable not to be suggested by the slightest reflection. Were it to be ably and completely prosecuted, it could scarcely fail, even in a few years, of leading us to a near view of the origin and causes of general, or febrile diseases; to the discovery of what situations, climates, and seasons, most favoured their production; of the order and rapidity of their progression, from one place to another, in the same or different countries; and of the most successful method of cure, as well as of prevention. Aided by a work composed of materials collected with such care, and drawn from so many and so distant quarters, we might be enabled to determine the relative healthiness of places; the causes why some were favourable and some unfavourable to health; their peculiar diseases, with the means of their removal and extirpation.—No plan seems more happily calculated to mark and explain the influence of different states of society, occupations, institutions, manners, exposure, air, modes of living, &c. &c. on health; and thus, indirectly, on morals, industry, and happiness: none more happily, for resolving the hitherto unexplained and difficult problem, proposed by the illustrious Sydenham,*—"whether a careful examination might *not* shew, that certain tribes of "disorders constantly follow others, in one determinate series, or "circle, as it were; or whether they all return, indiscriminately, "according to the secret disposition of the air, and the inexplicable succession of the seasons." Nor is the solution of this problem of small importance; since, in the first place, were it discovered that general diseases pursued a regular course, we might thence be prepared to receive and counteract them; or, were it

* Wallis's Sydenham, vol. i. p. 6.

determined that they depended on the qualities of the atmosphere, we should be directed to the proper object of investigation, and thus be well advanced towards a knowledge of their causes. But, whatever may be true in respect to the systematic succession of diseases, hinted at by Sydenham, it is certain that an apparent progress of a particular disease has sometimes been observable in the United States; as though the morbid principle possest the power of assimilating the atmosphere to its own nature, agreeable to determinate, but inscrutable and peculiar laws: sometimes rapidly extending, as in the *Influenza;* sometimes slowly, as in *Scarlatina.* It is perhaps difficult rightly to appreciate the benefits which the determining of a single point like this would confer on medicine; (whether by quieting apprehensions of such an extension of a disease, if indeed there were no reason to fear it; or by putting us on our guard, if such were clearly proved to be its nature)—but, whatever they may be, no method seems better adapted for ascertaining the fact, than by a publication like the one now proposed. By this means, the inquirer will be presented with a regular history of the progress of such a disease, from one extremity of the continent to the other; and be able to mark its effects in all the varieties of people, climate, and season; or, if it appear in several places, obviously disconnected, at the same time, of comparing the circumstances in which they resemble each other, and thus of determining its causes.—But, not to dwell longer on the recommendations to such a work, we may ultimately remark, that, when thus completed, the volume of every year will form the history of the health of the United States for the year preceding: a single glance of the eye will be equal to perceive what diseases prevailed at the same time, in all the intermediate situations, from St. Mary's to St. Croix, and from the Missisippi to the Atlantic; and individual experience, as well as new discoveries, will be propagated with unexampled benefit and celerity, to every part of the United States.

When we consider the extensive plan now proposed, the number of persons, and the time required for its execution, and the difficulties which always attend every work of the kind, we should indulge a presumptuous and reprehensible expectation, did we look to see it speedily and completely carried into effect. But, notwithstanding all reasonable allowance for impediments of this sort, we flatter ourselves that such materials may be collected, from time to time, as will enable us to present annually an acceptable volume to the public; while the great object of our proposed inquiries, as already explained, will gradually acquire consistence and patronage.

To the end that such a volume may be readily and regularly published, we have thought it advisable to add the following sub-

jects, to those already proposed, concerning all of which we would request information.

1. Accurate and succinct accounts of the general diseases which have formerly prevailed in any part of the United States.
2. Useful histories of particular Cases.
3. Histories of such complaints of professional men, mechanics, manufacturers, &c. as appear to originate from their peculiar employments, or the materials with, or about which they are employed.
4. New methods of curing diseases.
5. Accounts of new discovered or applied remedies, in rare or hitherto incurable diseases.
6. Extracts from rare, printed or manuscript, works, illustrative of the nature and cure of such diseases as now prevail in the United States.
7. Interesting information, relative to the minerals, plants, and animals of America.
8. American medical biography.
9. Accounts of former American medical publications.
10. Reviews of new American medical publications.
11. Medical news.

It will be obvious to every one, that the variety of subjects comprehended in this undertaking, will put it in the power of almost every other class of citizens, as well as of physicians, usefully to aid in its execution: and as the benefits which may result from its success are limited to no description of men, we are the more encouraged to solicit assistance from all whose situations enable them to afford it. We address ourselves, therefore, not to physicians only, but to men of observation, and to the learned, throughout the United States.

With respect to the mode of publication, we have not yet decided, whether to print an octavo volume annually, or to distribute the same materials into four quarterly numbers, equal to such a volume. This must be determined, in good measure, by the regularity and readiness with which we are supplied with suitable materials: and by those superior advantages for circulation which, after proper inquiry, one form shall appear to possess over the other. But, whichever may be preferred, seasonable notice will be given, and a subscription will be opened to defray the expence, when we are ready for publication; and, in the mean time, it is desired that all communications may be addressed to

SAMUEL L. MITCHILL, Columbia College.
EDWARD MILLER, No. 158 Broadway.
E. H. SMITH, No. 45 Pine-street.

New-York, Nov. 15, 1796.

...RY OF THE
UNIVERSITY OF MARYLAND
1813

MEDICAL REPOSITORY.

VOL. I.—No. I.

ARTICLE I.

MEDICAL ESSAYS.—No. I.

INTRODUCTION.

THE design of the Papers which will be presented to the Public under this title, is to illustrate the connection subsisting between Climate, Soil, Temperature, Diet, &c. and Health. The study of the histories of those wide-wasting diseases which pass under the name of Epidemics, (if, perhaps, we except those that are thought to depend on a specific contagion, the nature of which seems hitherto imperfectly comprehended,) is calculated to excite a suspicion, that they all have one common origin; arise in circumstances nearly similar; and assume those varieties from which they obtain their several denominations in consequence only of varieties in the number, force, combination, season, and application of those circumstances. Should a minute inquiry into every thing which relates to these pestilential maladies justify such a suspicion, we should, probably, discover their hitherto hidden cause, and be enabled to prevent its future operation. And, though the immediate principle of contagion escape our researches, the benefit resulting from such investigations will scarcely be less real, if they lead to a discovery of those circumstances which are necessary to its generation and influence.

It was, originally, the intention of the writer to compose a connected series of Essays, which should exhibit, in chronological order, a successive view of those epidemical diseases which desolated the ancient, and continue to spread devastation over the modern, world. But this is found to be impracticable. Of the slender

memorials handed down to us from antiquity, relative to the epidemics of those times, few, comparatively, are to be found in the United States. Of those few, this city possesses a very small and inadequate share; while our libraries are equally deficient in those writings of the moderns which might best supply their place. Those who have not considered this difficulty, and European writers in particular, can never sufficiently appreciate it. While they have free and ample recourse to originals, we are restricted to the more doubtful and unsatisfactory use of translations, compilations, and excerpts,--often erroneous in their attempts to convey the meaning of the author, or imperfect from their brevity, or perverted in their application.—But, notwithstanding the embarrassments which perpetually arise from this source, the writer is induced to believe, that, from the following essay, as well as such others of this collection as shall relate to ancient plagues, some benefit will result, if the patience of the reader keep pace with his own. For, though, in respect to these diseases, we may often be left in the dark as to particular symptoms, and modes of medical practice, yet memorials sufficient remain to indicate, in a satisfactory manner, the general causes of the diseases themselves.

In the composition of so much of the present Essay as relates particularly to the Athenian Pestilence, the authority of Thucydides has been principally relied on. Frequent reference will be found, in the first section, to the Philosophical Dissertations on the Greeks of the ingenious M. de Pauw, in the fidelity of whose quotations it has been necessary to confide more than was to be desired. But as the reader is always carefully directed to every authority, whether original or otherwise, it is hoped that no mistake will arise which may not readily be corrected. The writer ventures to believe none will be found to invalidate the inferences which seem to flow most naturally from the succeeding statement of facts. The elaborate commentary of Utinensis (a quarto of 600 pages,) on that part of the history of Thucydides which relates to the plague of Athens, mentioned by Mr. Gibbon in his history, is not to be found in America; and all the difficulties, in respect to original writers, spoken of above, particularly embarrass the subject of the present inquiry.

Hereafter, these essays will be continued at such intervals as may best subserve the purpose of the publication of which they are to form a part; and never to the exclusion of more interesting communications.

E. H. SMITH.

June 25, 1797.

THE PLAGUE OF ATHENS.

SECTION I.

IN the third year of the 87th Olympiad, answering to the 430th preceding the christian era, a plague broke out in the city of Athens, which, for its severity, duration, and the mortality it occasioned, exceeded all which, before that time, had been known to the Greeks: For it inflicted the most dreadful pains on all who experienced it; spared neither age, nor sex; destroyed near 5000 of the flower of the Athenian armies, with an immense multitude of the poor; and did not disappear till after it had exercised the most unexampled cruelties, for a period of little less than five years, and reduced the powerful republic of Athens to the very verge of ruin and despair.

Attica, of which Athens is the capital, is a small state, situated between the 37 and 39th degrees of north latitude, and comprehending a territory, the extent of which, though variously estimated, is on no computation very considerable.* Its figure is a triangle, having its two sides washed by the sea, and its base united to the continent. The face of the country is exceedingly broken and diversified by high, rugged and irregular mountains, contrasted with deep, winding, and pent up vallies.

The streams by which it is divided, are remarkably rapid; swelled in the spring, by the dissolution of the snows which crown the mountains; but shrunk up, by the excessive heat of the summer: resembling, in this respect, the Lehi and other rivers of Pennsylvania and the southern states.

The lower extremity of the Attic peninsula was, and continues, remarkably barren; being chiefly composed either of bare rocks, or desert sands. Towards Athens it assumed a more lively appearance; where the assiduous hand of cultivation intermingled the olive, the vine, and a variety of plants, with the firs and other evergreens that naturally ornamented the summits of the hills. But of other woods they were nearly destitute; so that, at the period of which we are speaking, fuel was both scanty and dear.

The soil of Attica, light and poor, produced no other grain than an indifferent barley; and the country was unfitted, no less on this account, than from its small extent, for pasturage. Eubea, and the neighbouring parts of Greece, furnished the Athenians with their meats; while their ships supplied them with wheat

* The Abbé Barthélémi makes it 66 ſquare leagues. Voy. du J. Anachar. chap. vi. M. de Pauw computes it to equal 250 ſquare miles. Philoſ. Differt. on the Greeks, vol. i. p. 3. Tranſlation. Edit. London.

from distant countries, but chiefly from the borders of the Euxine. The constant demand for grain at Athens, gave rise to a multiplicity of municipal regulations, frequently evaded by a spirit of speculation not unworthy, either for ingenuity or eagerness, of the present times; while the imperfect supply of better meats conferred a value on many kinds of flesh, birds and insects, at which modern delicacy would sicken.* Even at the present time, if we may credit the assertion of a late traveller,† no other flesh but that of goats is to be found in the Athenian markets. This defect of animals proper for food, created in the people of Attica an habitual preference of vegetables; and, conspiring with the meagerness of the soil, produced a state of cultivation unequalled in any country now known, if, perhaps, in deference to the testimony of Kæmpfer and Thunberg, we except Japan. The olive and the vine which flourish in a thin soil, were naturalized; earth was carried from the vales and deposited upon the hills; walls were constructed to support it there, and prevent its being washed down by the rains; and by contrivances not different in effect from our hot-beds and green-houses, the markets of Athens were regularly and daily supplied with fresh vegetables, even during the severity of winter. Nor was the industry of the people restrained to the securing of a steady sufficiency of the necessaries of life. Luxury and taste, which found little to gratify them in the meal, presided over the desert; not esculent plants alone, but the myrtle, the rose, and other flowering shrubs, were assiduously reared; and a winter entertainment in Athens, regaled the smell with fragrance, the eye with blossoms, and the taste with fruits of delicious flavor.

But, though industry and art could remedy the defects of soil, nature had been equally parsimonious, in another respect, where they could not prevail against her. Athens and Attica were poorly supplied with water. Their streams were brackish, impregnated with minerals or with salt; and the people were obliged to have recourse to pits and cisterns, to preserve that water with which they were scantily supplied by infrequent rains. For, beside that the air of Attica was, in general, exceedingly *dry*, plentiful rains were only known to happen when the *hellespontias*, or north-east wind, prevailed.‡—The climate of Attica bears a striking resemblance to that of many of the United States. Its latitude being nearly the same, variations could only depend on local cir-

* De Pauw, sect. xi. chap. 3.

† Travels through Switzerland, Italy, and part of Greece, &c. in 1787, 1788, and 1789, by Thomas Watkins.—London, Cadell, 8vo. 2 vols.

‡ De Pauw, chap. 10, vol. i. part 1.—It may be proper once for all, to inform the reader, that the chapters of De Pauw, which have been particularly consulted, are the 2d, 3d, 8th, 10th of section i. and the 6th, of section ii.—Other parts of the work are occasionally referred to.

cumstances. From the broken face of the country, we should naturally expect to find the seasons tempestuous; and from its nearness to the sea, the weather changeable. Both of these were true; but the snowy heights of the numerous surrounding hills, and the long chain of mountains which reached quite across and almost buried the adjoining kingdom of Thrace, preserved a more steady and severe cold in winter, than on the sea-coast; and a more uniform and suffocative heat, in summer. The north-west winds, which came from the icy summits in the cold season, were piercing; and the sultry and confined vales, when agitated by any breeze in the warmer months, seemed to have borrowed their gales from the deserts of Africa.—So excessive was the cold of the neighbouring states of Bœotia and Phocis, though both in a latitude lower than Norfolk in Virginia, that the Bacchantes nearly perished in a snow-storm, in the former; and an army, from the confines of Germany, were unable to sustain the rigors of a winter campaign in the latter.*

* De Pauw, chap. 10 section 1.

The following passages, from the "Works and Days" of Hesiod, a poet who resided at Ascra, a village in the neighbouring country of Bœotia, and but a few leagues from Athens, serve to confirm this account of the climate of Attica.

"The month all hurtful to the lab'ring kine,
In part devoted to the god of wine,
Demands your utmost care;* when raging forth,
O'er the wide seas, the tyrant of the north,
Bellowing through Thrace, tears up the lofty woods,
Hardens the earth, and binds the rapid floods.
The mountain oak, high tow'ring to the skies,
Torn from his root, across the valley lies;
Wide spreading ruin threatens all the shore,
Loud groans the earth, and all the forests roar:
And now the beast amazed, from him that reigns
Lord of the woods, to those which graze the plains,
Shiv'ring the piercing blast, affrighted, flies,
And guards his tender tail betwixt his thighs.
Now nought avails the roughness of the bear,
The ox's hide, nor the goat's length of hair,
Rich in their fleece, alone the well-cloth'd fold,
Dread not the blust'ring wind, nor fear the cold.
The man who could erect support his age,
Now bends reluctant to the north-wind's rage."

* * * * *

"Now does the boneless polypus, in rage,
Feed on his feet, his hunger to assuage;
The sun no more, bright shining in the day,
Directs him in the flood to find his prey;
O'er swarthy nations, while he fiercely gleams,
Greece feels the power but of his fainter beams.

* This answers to the month Nivose of the new French calender.

Sometimes a sudden and severe frost destroyed even the roots of the vines and the trees.*

The winter sat in very early in Attica. The cold winds began to prevail about the autumnal equinox; when the north-west, in particular, seemed to descend, fraught with chills, perpendicularly, on the city of Athens. Its greatest height was about the first of February—nor has the climate undergone any change since the time of Pericles, in those particulars, as appears from the publications of Riedesel and Wheeler†—the last of whom was prevented from visiting the top of Mount Hymettus, by the snows in February, and found his woollen clothes scarce sufficient to protect him against the cold of the vallies. The narrow and rapid streams of Attica and Peloponnesus were seldom fastened by ice, notwithstanding this rigorous winter; but the broader rivers of Thrace, a country situated in a much warmer latitude than New-York, were frozen over like the Connecticut and the Hudson.

It resulted, necessarily, from this variety of seasons, that a great difference existed between the summer and winter dress of the people. In the cold season, it was difficult to clothe too warm; in the warm season, to go too thinly clad. The Athenians, in summer,

> Now all things have a different face below;
> The beasts now shiver at the falling snow;
> Thro' woods, and thro' the shady vale, they run
> To various haunts, the pinching cold to shun:
> Some to the thicket of the forest flock,
> And some, for shelter, seek the hollow rock."
> Cooke's Hesiod, verse 175.
>
> "When with their domes the slow-paced snails retreat,
> Beneath some foliage, from the burning heat," &c.
> Cooke—verse 256.
>
> "The season when the dog resumes his reign,
> Weakens the nerves of man, and burns the brain.
> Then in the shade avoid the mid-day sun," &c.
> Verse 270.

The description of winter would well apply to the northern boundary of the United States; and the direction in the last line of the last quotation is well adapted to the climate of Georgia and the Carolinas.

* Theophrastus—De Causis Plantarum, lib. v. quoted by M. de Pauw.—Instances of this kind are frequent in our own country. I have known such a frost near the city of New-York, in June; and a snow-storm happened in the May of 1760, after the apple-trees were in blossom; and another in May, 1774.

† Observ. sur le Levant, par M. Riedesel. Wheeler's Travels in Greece, vol. ii. both cited by De Pauw, but neither to be found in the New-York and Philadelphia libraries.—The accounts of these gentlemen do not seem perfectly to accord with that of Mr. Watkins, unless we are to suppose the winter in which he was at Athens, unusually moderate. He was there in December, 1788—when he says, "the season which is particularly severe at Constantinople, is here open." Perhaps the greatest cold happens after December, at Athens, as appears to have been the case at New-York, for some years past.

rambled about, and performed their exercises, nearly naked, in their extensive porticoes and public groves. In the winter, they wrapped themselves up in woollens, and shrunk into their close, confined, and heated rooms.* Even their nice sense of the graceful in attire yielded to the imperious mandates of the season; and the actors of their theatres, as well as the spectators, covered themselves with a fleecy mantle. The women, alone, with that pertinacious regard to external appearance, which has been little weakened by time, were remarkable for a light dress, ill-suited to protect them from the terrors of the winter. But their recluse and sedentary lives did not so much expose them to its influence, as the active habits of the men, who monopolized, at the same time, business and diversions.†

To causes already enumerated it may doubtless be attributed that the principal part of the food of the Athenians consisted of vegetables.‡ Even at the tables of the rich, their scanty and minute dishes of meats, which formed the first course, or the meal, were soon removed, to make way for fruits of every flavour, the rich olive, the delicious grape, and the honey of Hymettus.§ To the poor this slender supply of flesh was denied, as beyond their means to procure; and, except at their public feasts, we may

* Hesiod, in the Poem before cited, gives the following directions for a winter dress.

"A winter garment now demands your care,
To guard the body from the inclement air;
Soft be the inward vest, the outward strong,
And large to wrap you warm, down reaching long:
Thin lay your warp, when you the loom prepare,
And close to weave the woof no labour spare.
The rigour of the day a man defies,
Thus cloth'd, nor sees his hairs like bristles rise.
Next for your feet the well-hair'd shoes provide,
Hairy within, of a sound ox's hide.
A kid's soft skin over your shoulders throw,
Unhurt to keep you from the rain or snow;
And for your head a well made covering get,
To keep your ears safe from the cold and wet."

Works and Days, v. 215.

† To this recluse life of the Athenian women Hesiod alludes in the following lines—" Works and Days, v. 195.

" ——————— the tender maid,
Free and secure, of storms nor winds afraid,
Lives, nurtur'd chaste beneath her mother's eye,
Unhurt, unsully'd, by the winter's sky."

In addition to De Pauw, consult Voy. du J. Anachar. chap. xx. and Potter's Grecian Antiquities, B. iv. chap. 13.

‡ Potter's Antiquities, B. iv. chap. 18.

§ Watkins, in 1788, enumerates " rice, dried figs, olives, honey of Hymettus, and rich milk"—among the delicacies which Athens afforded, to compensate him for goat's flesh, few roots, and bad bread.

presume, they rarely tasted it. On these occasions, indeed, they indulged in gluttony and drunkenness without restraint.* Nor were the private entertainments of the Athenians always more becomingly conducted.* Women, as well as men, at certain feasts gave way to the most disgusting intemperance and disorder; as if resolved, at such times, to avenge themselves, by the extent and violence of their debaucheries, for that general state of dependant insignificance to which they were subjected.* But such opportunities occurred, neither for them nor for the people at large, so often as to have any permanent influence on their health. Their vegetable diet was mostly persisted in. Roots and fruits abounded in the winter; honey they always had; and the dried grape was then substituted for the fresh. Thus a steady succession of garden vegetables, of fruits, and even of flowers, became essential to the Athenians; and a failure in quantity, or a defect in quality, tended to excite commotions and insurrections in Athens, as certainly as like circumstances in respect to bread in Paris. But frugal as they were in time of peace, in war they were obliged to submit to still greater frugality, and a less agreeable fare. The subsistence of the Athenian armies consisted of salted meat, particularly fish, dried fruits, cheese, olives, onions, and an inferior species of barley.† Nor were the poorer citizens of Attica better provided. Pent up either in their boroughs, or in the capital, they were restricted, at once, from their accustomed supplies, which the rich only could draw from their extensive gardens: for the Athenians held a feeble face on the land side; and their territory was frequently left, undefended, to the ravages of a merciless invader. Nothing could exhibit a more striking and immediate change in the ordinary food of the people, than the preparations for war. Yet, how great soever were their sufferings, and though commotions succeeded commotions, their vanity and ambition, their numerous spectacles at home, and their splendid victories abroad, deceived them of their sorrows, and elevated them above their misfortunes.

Domestic slavery existed, in full force, throughout Greece. In Attica the generous temper of the people mitigated its severity; and, if we except the wretches who were doomed to labour in the mines, the slaves were treated with mildness and indulgence. This might be the more necessary, as they greatly exceeded their masters in number, and were employed on all public works, and sometimes in the armies. The number of slaves in Attica is estimated at 400,000; and it is not probable that the citizens of the Republic, together with strangers resident in the Athenian territory, exceeded 100,000, including women and children The permanent

* See Voy. ou J. Anachar. chap. 25. De Pauw, sect. iii. chap. 2. Potter, B. iv. chap. 20.

† Potter's Antiquities, B. iii. chap. 4. De Pauw, sect. ii. chap. 3.

houses of Athens and its suburbs are computed by Xenophon, to amount to 10,000; and when we consider that most of them were mere cabins, we shall not think the residents of that city more numerous than 50,000: which is the estimation of De Pauw. The remainder were inhabitants of the neigbouring boroughs; employed in the mines; and scattered over the face of the country. Fifty thousand people, therefore, may be supposed to have steadily resided in Athens, in time of peace. And it is the more material to obtain correct ideas on this point, as very important deductions will be found irresistibly, to flow from its establishment.

The extremity of the Attic peninsula seems to have been little susceptible of tillage. Its chief population consisted of the slaves employed in the silver mines of Laurium, and the persons concerned in their superintendence. Northward, and to the north of Athens, the whole country was covered with orchards and vineyards. It was in the country that the wealthy and luxurious Athenians most delighted to dwell. For while the private buildings of the city exhibited an appearance of meanness and wretchedness below that of our most miserable frontier towns, every decoration that architecture, sculpture, painting, gardening, and planting would bestow, was expended on the villas of the rich. As in European countries, their plantations oftentimes extended several miles in circumference, while the poor possessed not a foot of earth. Yet the superior wretchedness of the city poor, attached the country people to their habitations, where they were universally more comfortably settled, and led more tranquil, healthy, and independent lives.

Such was the general condition of Attica, and the Athenian people: but the city of Athens, the seat of the severe calamities which were brought upon the nation by the Plague, demands a more particular consideration.

The city of Athens, situated on the left side of the peninsula of Attica, and built almost on the border of the Saronic gulf, lies in north latitude 38 deg. 5 m. or nearly that of Norfolk in Virginia. This place, afterwards so celebrated, at first consisted only of a few miserable cabins, erected on the top of a rock, in the midst of an extensive plain. As the number of inhabitants increased, the surrounding plain became settled: the original city was devoted to the gods, and was called Acropolis, or the Citadel; while the rest of the settlement was denominated the Lower City. The Citadel was inclosed in a proper wall; and a wall, common to that and to the lower city, surrounded the whole. The population and commerce of Athens extending, the city extended with them; and by means of the Long Walls, which reached to the sea, was made to comprehend three harbours—the Piræus, Munychia, and Phalerum.

The *Citadel*, if perhaps we except the ministers and servants of the temples, contained no inhabitants. Nor does it appear to have been visited by the plague.

The *Lower City*, like most of the cities of modern Europe, and many of our own, was settled without regard to any plan. Each person regulated the position of his house by his own particular notions of convenience; and thus, while in some quarters the buildings were huddled together, in others large places were left unlocated.—The circumference of the city, or the space comprehended within the wall, was about seven miles. This extent of territory, though much more considerable than was necessary for the accommodation of the proper inhabitants, afforded them little advantage; for scarcely a third was built upon. A large portion of it, the Marshes, was unfit for use. Some parts were rocky; others covered with groves, and devoted to particular exercises; and many places, the best adapted for building, were left desolate. For, when any citizen was convicted of treason, the laws directed his house to be razed, his grounds to be laid waste; and forbade the erection of other buildings, and the prosecution of further improvements, on the places. This sentence, it is true, was sometimes reversed by particular rulers; but, at the time now treated of, many such vacant spots were left. Of these, the *Pelasgic* was one, and probably the most extensive; and its settlement was specially prohibited by the Oracle.—But a further reason for leaving so much ground unoccupied, was for the accommodation of the country people, who, in time of war, were obliged to take refuge within the walls of the capital. Here they erected, without any order, their temporary and wretched huts; leaving their fields to be desolated by their furious adversaries.

Marshes and stagnant water were, by no means, confined to the city. Much of the road to the harbours was marshy; and the Ilyssus and Cephisus wandered through the extensive marsh of Phalerus, which lay directly south of and near the lower wall, leading to the harbour of that name.

The northern and eastern environs of Athens, partook of the same misfortune. The Academy, where the celebrated school of Plato was kept, suffered severely, in consequence. That philosopher himself, many years after the plague, and when much labour and money had been expended to render the situation healthy, was made sick by the dampness of the air, and obliged to remove to the higher country of Colonna. Nor was the Academy more salubrious from the vicinity of an extensive burying-ground, on one side; numbers of tile-kilns, on the other; and the rows of thick planted trees, (a common fault in Athens)—which excluded the sun, and prevented a free circulation of the air.—Within the city, this was not the only obstacle to due ventilation. The nume-

rous streets of the inhabited quarters were narrow, irregular, unpaved, and worse built than any of the towns in the United States. The public buildings alone excelled those of other countries for elegant magnificence, rendered more striking by contrast with the uniform meanness of those by which they were surrounded. For it was the policy of the government to discountenance private expence in building; and the Areopagus sat the example of this rigid and baneful simplicity, by holding their own assemblies in a house whose cieling was of clay.—The wealthy fled into the country, where they rioted in luxury at their superb villas; but the regular citizens were obliged to submit; while the poor were consoled by constant employment in constructing and beautifying the national edifices, whose splendor, equally shared by rich and poor, gratified their vanity and elevated their pride. Their own dwellings, indeed, were little better than the wigwams of our savages; few of the rich had houses of more than a single story; and where upper apartments were added, the second story projected into the street, and was ascended to by stairs on the outside.*

The number of houses in Athens has been already stated at 10,000, exclusive of temples, other public edifices, and manufactories. These last were numerous and extensive. A whole square was devoted to the cabinet-makers; another to sculptors; and several to the workers in metals.

The following facts may serve to convey some idea of the ordinary cleanliness of Athens.

The people, it has been noticed already, ate but sparingly of meat. Most of their cattle were offered up as sacrifices to the gods. Sometimes the victims were portioned out among the assistants; sometimes a feast succeeded, when the limbs, half consumed, were wantonly thrown about the streets; sometimes the blood and entrails were burnt, and thrown into a ditch; but oftener they were left undisturbed, or unburied, at the places of sacrifice; and this was so common, that some parts of the town must have borne a near resemblance to a slaughter-house.—To these circumstances, De Pauw, with great probability,† ascribes it that Athens was

* In many European towns, and even in London so late as the year 1784, and probably later, the same fact has been observed. In the narrow streets where this manner of building prevails, the tenants of the lower stairs never feel the sun, or see him shine. Those who live in the upper rooms can shake hands, across the street, and from their front windows.—Is it surprizing that these places are rarely free from low fevers?

The present town of Athens is as badly built as ever, according to Mr. Watkins; and its population reduced to about 5000 people; others say 10,000.

† Compare this with Mr. Bruce's account of the city of Gondar, in Abyssinia. The hyænas enter Gondar, in the night, to prey on the remains of slaughtered animals, which lie in the streets.

perpetually infested with wolves.* The rewards offered for the destruction of these animals were insufficient while the cause remained; nor are they extinct, if we may believe a modern traveller,† at this day, in the vicinity of Athens.

From the south-western gate of Athens, two walls took their rise; the southernmost of which extended, about $3\frac{1}{2}$ miles, to Phalerum; the northernmost, about 4 miles, to the Piræus. Between these two ports, but nearest Phalerum, lies Munychia; which, by means of a third wall, near seven miles in length, conformable to the windings of the margin or beach, was included with them. Thus these three walls, the two former of which were called the Long Walls, formed a triangle, whose irregular base was on the sea, and its narrow apex at the wall of the city. The extent of Athens, if determined by the walls which inclosed as well the town as the ports, is estimated at 22 Attic, or about 17 of our miles.

At the time of the plague, the *Piræus* was the principal port; though all three were in constant use. Here the vessels and ships of war were built, victualled, refitted, and stationed. Here all commodities were shipped and received from abroad. These, and the borough of *Piræus*, which was situated between that port and Munychia, were the receptacles of their seamen, of residentiary and trading strangers, of manufacturers and artisans, of all employed in traffic and the labours of the ports, and of the many wretches which commerce and navigation never fail to create. The harbour and town of Piræus were very populous. Three docks distinguished the former; and an extensive portico, composed by the union of five inferior porticoes; two forums, one near the sea, and another towards the city; a spacious mart, the resort of all the trading nations; and a prodigious arsenal; ornamented the latter. From hence to Athens was about four miles, over a marshy road; the width of which, between the walls, was near $\frac{1}{2}$ a mile at Piræus, and about 50 rods at Athens. So small and confined was this ancient emporium of commerce; and when we recollect the inferior size of vessels at the time of which we are speaking; when we bear in mind the assertions of late travellers, who maintain that this port would not afford anchorage for fifty modern ships;‡ when,

* "She (Greece) breeds the ravenous wolf, the bear, the boar,
Pernicious monsters!" Fawkes' Theocritus, idyl. xxv. l. 201.

"Any one who brings in an he-wolf, shall have five drachms, and for a she-wolf, one." Law of Solon. Potter's Grecian Antiquities, vol. i. page 167.—In the time of Xenophon, the hunters alone were allowed to pass the line of defence, in time of war, in order to destroy bears and wolves, which would otherwise desolate the country. De Pauw, sect. ii. chap. 6.

† Spon. Voyage de la Greece.

‡ "Description of the Gulph of Venice and the coasts of the Morea," by M. Bellin—referred to by De Pauw, sect. ii. chap. 6.

Watkins, vol. ii. p. 279. says that Phalerum is "so shallow that a large

too, we remember the immense crowd of people who actually resorted there in times of peace, and the navies fitted out by the Athenians, in the Peleponnesian war; we shall have some idea of the confusion, mixture, and miserable accommodations which the residents of that quarter submitted to, in its ordinary state of population.

The Athenians in general, if we except the regular inhabitants of the town, were remarkably attached to a country life. Neither the splendid ceremonies, nor the enchanting spectacles, of the city possessed sufficient allurements to entice them from places where they acted without restraint, and indulged in exercises equally conducive to health and pleasure. The rich were more luxurious, and the poor better provided for. This tranquility and enjoyment had been interrupted by the Persian invasion; but, after the liberties of Greece had been asserted and secured, the Athenians re-settled their territory; beautified it with new groves and villas; covered it with their wooden huts; and spread an ample and luxuriant vegetation over all its fields. Such was their situation at the commencement of the Peloponnesian war.

Differences had subsisted between the Spartan and Athenian republics, for a long time. Negociation had been ineffectually resorted to, for their accommodation, till at length, Athens, by the persuasive and irresistible eloquence of Pericles, was led to a declaration of hostilities. The Spartans and their confederates were powerful by land; the Athenians by sea. The former trusted to their armies; the latter, to their fleets. It was their usual practice to leave their frontiers unguarded, and, at the alarm of war, retreat within the city and the walled boroughs. A similar conduct was recommended to them, by Pericles, on the breaking out of the present war, in the year 431, preceding the christian era. But, though they followed his advice, from a conviction of its propriety, yet never was a removal attended with circumstances more melancholy, and regrets more poignant. The people had just become comfortably settled, and the country beginning to respire, after the defeat of the Persian invaders. These pleasant accommodations, and these rural scenes, passionately beloved, they were forced to relinquish, unprovided with shelter in the city, from which in times of the greatest prosperity they hastened to depart, and where they were now to seek their sad and reluctant refuge. They were obliged, with their own hands, to pull down their new-built houses, and to abandon the fields, tilled by themselves, to a merciless and de-

barge could not float in it"—and Munychia is in the same condition. If another remark of this writer be accurate, vol. ii. p. 293. that "the soil of Athens is from 12 to 18 feet higher than it originally was," it will appear that some conficerable change has taken place in the capacity of these ports. That an alteration has been effected is evident by the circumstance of the channel both of the Ilyssus and Cephysus being dry. See p. 304 and 310 of the same work.

solating enemy. Nay more, to forsake "their temples, which, "from long antiquity, it had been their forefathers' and their own "religious care to frequent;" "to quite alter their scene of life, "and each abandon as it were his native home. When they were "come into the city, some few had houses ready for their reception, "or sheltered themselves with their relations. The greater part "were forced to settle in the less frequented parts of the city, in "all the buildings sacred to the Gods and Heroes, except those in "the citadel, the Eleusinian, and any other from whence they were "excluded by religious awe."* So urgent was the necessity, that, contrary to the express prohibition, as it was supposed, of the Pythian oracle, they seized upon the interdicted ground of the Pelasgic, and erected there their miserable huts. Set up wherever space was found, in the utmost disorder, and prest together, they experienced no free circulation of the air; while their diminutive size provoked the sallies of a sarcastic poet,† who compares them to butts or casks. When the Pelasgic was fully occupied, there was not yet sufficient room for the new-comers. "The city," says Thucydides, "was not able to receive so large a conflux of people." "Many were forced to lodge in the turrets of the walls, or wherever "they could find a vacant corner." "Afterwards the Long Walls, "and a great part of the Piræus,‡ were portioned out to them, for "little dwellings." "Some," he remarks in another place, "had "no houses, but dwelled in booths, where there was scarce room "to breathe." "At the same time, they (the Athenians) were "busied in the military preparations, and fitting out (at this very "Piræus) a fleet of one hundred ships, to infest Peloponnesus." This was in the spring of the year 431; the flocks and labouring cattle had been previously sent over into Eubea, and the neighbouring islands; and the harvest was left standing. By this removal, the population of Athens was augmented from 50 to more than 400,000; all supplies of fresh meats were at an end; the city was in a state of blockade, dependent for its vegetable nutriment on the importations and hoards of the preceding year, and the scanty product of the fields in its immediate vicinity.

Such was the situation of Attica and the capital, when, "in "the height of summer, and when the harvest was ripe," the Spartans and their confederates broke into the Athenian territory, and laid it waste even to the walls of Acharna;§ which they closely

* Thucydides, B. ii. Smith's Translation.

† Aristophanes.

‡ i. e. The streets, market-places, porticoes, &c. of this borough, were partitioned off, into little rooms, for the families from the country.

§ Acharna was about six of our miles from Athens; and contained, at this time, 3000 fighting men. Beside this, there were several smaller towns, also garrisoned, and in the same condition as Athens and Acharna, in respect to supplies.

besieged. But the southern extremity, and most barren part of the Attic peninsula, protected by the fleet, escaped this year. Thus were the principal supplies of Athens, for the ensuing year, totally destroyed. Nor were the people shut up within its walls, insensible to this calamity. A scene like this they had never witnessed before; and its horrors were magnified by their apprehensions of famine; by their grief on quitting their fields and dwellings; by their resentment against the actors in it; and all were heightened by the earnest entreaties of the Acharnians, to sally out, and repulse the enemy. Commotions and insurrections followed; the courage and conduct of Pericles were loudly arraigned; and it required the utmost efforts of his address and eloquence, and the full weight of his popularity, to restrain the disaffected.

When the Peloponnesians had withdrawn from Attica, the Athenians, as if it were to leave no possibility of supplies, for themselves or others, on the north of Athens, marched into the adjacent country of Megara, and subjected it to similar devastations.

Those who remember the desolation effected under the orders of the celebrated Marshall Turenne, or the more recent horrors of the Vendée, will have some suitable notion of the condition in which Attica was left by the Peloponnesians. Neither fire, nor sword, was left unemployed, in this terrible war against the harmless earth; vines and fruit-trees were wholly destroyed; the government of Sparta encouraged its rapacious soldiery; and "nothing was left to the vanquished but their temples and their tombs."*

The Athenians past the first winter of the war, pent up within their city, discontented, and unhappy; in part, supported by their naval strength, and cherishing the vain hope that their enemies would not renew their depredations; or, at least, not to the same degree.

Early in the ensuing spring (of 430, A. C.) the Peloponnesians made a fresh incursion. Whatever had escaped before, or had since grown up, on the north and west of Athens, was now utterly laid waste. They were busied in this work, when the Plague, about the last of April or beginning of May, suddenly appeared in the Piræus; and afterwards, during the same summer, extended over the whole city.—The Peloponnesians, having completed their ravages in all the Attic territory, above Athens, fell upon the southern parts of the peninsula, and rendered them equally desolate. Thus, to use the words of Thucydides, "they made the whole country one continued devastation."—If the Athenians who had removed into the city were before afflicted, all their sorrows were now redoubled. Nor could the talents of Pericles,

* Scholiast of Demosthenes, on the "Discourse against Timocrates," quoted by De Pauw, sect. i. chap. 8.

which prevailed upon them to continue, and which directed the efforts of the war, re-animate their spirits amid such unexpected calamities.—"The poor citizens who had but little, could not bear, with patience, the loss of that little. The rich and the great regretted the loss of their estates, with their country-seats, and splendid furniture."*

Meantime, the plague continued to extend; and prevailed, with great mortality, the whole of the years 430 and 429. However, in the last of these years, the country respired a little. The enemy made no ravages, and Athens had opportunity to gather in her vegetable harvest. This was followed by an abatement of the plague, during the following year, 428.—In the summer of that year, and "when the corn was full-grown," the Peloponnesians entered Attica. But the Athenian horse and light troops kept them off; and, by means of repeated skirmishes, defended and protected "the parts adjacent to the city." This allowed the people to gather a second, but more scanty harvest; and they past the succeeding summer, with a further exemption from the plague; which, however, had at no time deserted them.† But, in the autumn of 427, and about the equinox,‡ it broke out afresh, and with augmented violence. As a precursor to this severe calamity, their enemies, the preceding summer, had renewed their depredations, with such success as to be necessitated to retire from the Athenian territory, for want of forage for their horses.—The year ensuing, (426) the plague raged with unexampled fury and mortality. But this was the limit of its power. Causes, hereafter to be investigated, operated to deliver them from its dominion; and the incursions of their hostile neighbours now ceasing, health was restored to Athens.

The relation apparently subsisting between the plague of Athens, and the state of the citizens, in respect of vegetable supplies, is too curious and important to be lightly passed over; and will be best exhibited by the following table, for the introduction of which it seems unnecessary to offer an apology.

Attica ravaged, and the vegetable supplies cut off, in the summer of	431, A. C.
The plague breaks out in the spring of	430
The ravages renewed and extended, in the summer of	430
The plague at its height in	429
No devastations in	429

* Thucydides, B. ii.

† The New-York fever of 1795, though it commenced the last of July that year, was nearly extinct on the fourth of September; but revived about the 15th, and increased in mortality till the middle of October. The greatest mortality of the fever of Philadelphia, in 1793, was in October; nor did the winter entirely banish all symptoms of the disease.

No plague—or but very little, in 428
Depredations in the latter part of the summer, but not so extensive as formerly, in 423
The plague holds off all summer, but recurs in autumn 427
The ravages more extensive than ever, in 427
The plague worse than ever, in 426
Tempestuous season, &c. obliges the Peloponnesians to retire, without committing any depredations, in 426
No recurrence of the plague either in 425

or after.—The Peloponnesians were in Attica but fifteen days this year, (425) in which time they had opportunity to inflict very little injury on the country.

SECTION II.

THE preceding narration of facts has prepared the way for the discussion of a question in relation to the disease under consideration, which has always given rise to great variety of opinion, and been deemed of much importance, in the history of Epidemics—Whether the Plague was imported, or of local origin? As no certain evidence is left to us by the ancients, on this interesting point, we are necessitated to have recourse to the exercise of our own judgments, on a comparison of all the circumstances connected with this memorable calamity. It, indeed, appears, from Thucydides, that a report prevailed in his time, that the Plague originated in Africa, and was imported into Athens. But, from the manner in which this report is noticed by the historian, it may be inferred that he thought it entitled to very little credit; for he declares that the disorder fell suddenly on the people of the Piræus, so that it "occasioned a report that the Peloponnesians had caused poison to be thrown into the wells;" and he calls upon "every one, physician, or not, freely to declare his own sentiments about it, and to assign any *credible* account of its rise, &c."* Great stress, it is true, is not to be laid on an argument like this; it is sufficient, however, to counteract the absurd dogmatism of later writers, who have not hesitated to represent the disease as propagated from imported contagion.—Medicine, at this period, had scarcely disencumbered herself of her swaddling clothes; and though no person will venture to question the sagacity of the Athenians, and the peculiar talents of Thucydides for observation, neither his countrymen, nor himself, can fairly be supposed to have examined

* Smith's Thucydides, B. ii.

this subject with philosophical precision. The method least liable to rational objection will be, carefully to enumerate *all the circumstances connected with this memorable calamity.*—To this enumeration, therefore, we shall immediately attend.

1. The condition of the city of Athens, in its ordinary state, was favourable to the generation and continuance of febrile diseases, in their season.

2. The people of the town, as well as of the country, were accustomed to a vegetable diet, and to much and free exercise.

3. The population of Athens, in common, was small in proportion to its extent.

4. Its population, during the first years of the Peloponnesian war, was increased beyond all capacity of the place for accommodation.

5. The country people, especially, underwent a remarkable change of air, lodging, diet, and mode of life.

6. Exercise was, in great measure, denied to all; few were provided, in any considerable degree, with fresh provisions; all, probably, had salt meats; all were disheartened; most of them were without employment, and idle.

7. The plague first appeared in that part of the city where there was the least cleanliness; the least ventilation; the worst accommodations of all sorts; and where the people were the poorest of the country poor.

8. In this part of the town it broke out *all at once*, or "fell suddenly," to use the words of Thucydides; and thence, *gradually* extended to the better settled, and more healthy parts of the city. It was longest in reaching or appearing in the neighbouring country towns of Attica, which were, like Athens, in a state of siege or blockade.

9. It commenced in the sultry season of the year; after people had passed a year in this new and wretched situation, oppressed in mind, and harrassed in body; and as soon as the summer sun came to operate on the collected filth of winter.

10. Those who came into the town, from the country, suffered most; and the poor more than the rich; and this in proportion as they were badly lodged and provided for.

11. Like other epidemical diseases, the plague of Athens converted every other complaint into itself, or banished it, during its own continuance.

12. It was fatal to domestic animals, as well as to men; and birds, and all wild animals, shunned the city during its prevalence.

13. It affected the Athenians only, when carried by their troops into other countries; and was never propagated into any other State than theirs—not even the contiguous towns of Peloponnesus

and Bœotia—notwithstanding the numerous encounters between the hostile nations.

In the summer of the year 430 A. C. when the plague first arose, the Athenians were fitting out a fleet, to commit depredations on the coast of Peloponnesus. This armament landed at Epidaurus, and expected to take the city; but the plague raged among the troops, destroyed numbers of them, and they were obliged to return without having effected their purpose. Plutarch* says that they communicated the disease to all who had intercourse with them. By this he may mean to all their allies.—The total silence of Thucydides, a cotemporary writer, on this point, would be a sufficient reason for believing this statement to be inaccurate, even if he had not, elsewhere,† expressly mentioned that the plague was never propagated to Peloponnesus.

The same summer, the Athenians sent a reinforcement to their army which was carrying on the siege of Potidea, a town of Chalcidica, lying on the gulf of Therma. The reinforcement amounted to 4000 men; and they found the troops before Potidea healthy. This did not long continue. They fell sick themselves; communicated the pestilence to the others; and returned, after a stay of forty days, having, in that time, lost 1050 of their number. Yet the old troops continued the siege, and afterwards took the place; and the Potideans were never affected by the disease.‡

14. The condition of the skin, mouth, &c. (hereafter to be more particularly noticed,) bore a striking resemblance to that state of the same parts which occurs in scurvy; a disease universally attributed to confinement, bad air, and want of fresh provisions.§

15. There was always a decline of the plague, when the harvest of the preceding year was spared; and the plague returned, when the harvest of the preceding year was destroyed.

The second great prevalence of the plague did not commence till after the middle of September; when the ordinary causes of fever are most accumulated; when the scanty supplies of the preceding year may be supposed to have been consumed; and when

* Article—Pericles.

† Smith's Thucydides, B. ii.

‡ Neither the Philadelphia fever of 1793, nor the New-York fever of 1795, were communicated to other places. The citizens of both places were, in numerous instances, seized with the fever, after leaving those cities; but their country attendants escaped.—The Philadelphia fever appears to have been contagious—i. e. communicable by one to another, from contact, &c. The New-York fever, on the contrary, was rarely, or never, so communicated.

§ It is worthy an attentive investigation, whether the peculiar ulcers, buboes, carbuncles, &c. of the plague, which render it worse than our yellow fever, do not depend on salted meats, other defects in diet, and such circumstances, generally, as are known to occasion scurvy.

those for the year succeeding, which should then have been gathered in, were cut off.*

16. The plague did not cease till after the incursions of the Peloponnesians were given over. But the consideration of the causes of its disappearance will be deferred for the conclusion of this section.

17. The Athenians, themselves, accused Pericles of having caused the plague, by bringing so vast a number of people into the city, who were ill-provided with lodgings, and lived in idleness, infecting the air, and poisoning one another.†

18. A further indication of the sentiments of the Athenians, concerning the source of their pestilence, may be perceived in the following fact. After the war, they constituted five distinct places, in separate Cantons, asylums for the country people, in times of invasion; nor have we any certain account of any future plague infesting their city.‡

A due consideration of the facts just enumerated can hardly fail to impress the mind of the reader with entire conviction of the domestic origin of the Athenian plague. Nor should we want medical authority to countenance us in the belief, if opinions could be admitted as confirmation. Yet, to pass by those of many living physicians of deserved reputation, who might be supposed improperly biassed in their decision on this question; and not to insist on the pointed declaration of the illustrious *Haller*, who considers the plague of Athens as an ordinary contagious fever, of local origin;§ it may not be impertinent to quote the words of the sagacious and learned De Pauw; whose opinion may be the more relied upon, as that elegant writer, not being a physician, was unlikely to be influenced by the prejudices so liberally ascribed to professional writers. After asserting the domestic origin of the plague, and noticing the sentiments of Haller on this point, he says, "To seek in Ethiopia the origin of a disorder, so evidently "arising from multitudes of men heaped and pressed together, "would be absurd; especially as its influence did not extend be"yond the walls of Athens, and was totally unknown in every "other part of Greece. Similar effects would be now produced

* How far may HABIT be considered as influential in this case? The plague originally broke out in the first of summer: could the people have become so habituated to their situation as to require the accumulation of all the ordinary, as well as the extraordinary causes of fever, to the renewal of the disease?

† See Plutarch—Life of Pericles, near the end.

‡ London has never been afflicted by any extensive pestilence since the town was rebuilt, the streets widened, and sinks and water-closets provided. The low fevers of that city are mostly confined to the poor, and to such as reside in the old, narrow and dirty streets; which have derived little benefit from modern improvements.

§ Biblioth. Med. Prac.

" in any town where the particles of the atmosphere are entirely " changed, by being charged with different noxious effluvia, as " frequently happens in fleets, or among armies encamped in too " close order."*

Thus the sentiments of men not to be suspected of being any way warped by recent occurrences and discussions, are found to countenance the inferences ventured to be deduced, in this Essay, from an examination of facts relative to the Attic pestilence. But it is time to proceed to the consideration of the disease itself.

In the following account of the symptoms of the plague of Athens, the authority of Thucydides is principally relied on. He was a cotemporary writer, resided in Athens at the time, and was himself afflicted with the disorder. His relation is rather that of an historian than of a physician; for he purposely avoids noticing particular symptoms, though he gives us reason to believe that a great variety was observable in individual cases. Beside Thucydides, we have no original author on this epidemic. The *cases* left us by Hippocrates, if indeed written by him, must relate to some later plague, and in some other place. All the documents to establish the reality of his presence at Athens at the time we are treating of, are manifestly suppositious † Nor is more credit due to the description of Lucretius;‡ though arrayed in all the transcendent charms of eloquence and poetry. He has done little more than versify Thucydides; interweaving with the words of the his-

* De Pauw, sect. ii. chap. 6.

† On this subject consult Mead's Works, p. 210. Edit. Edinb. 8vo. Athenian Letters, Letter 316. by Dr. Heberden, who, in a professed account of Hippocrates, is totally silent as to his fabled journey to Athens, and his equally fabulous exploits there, during this plague; but particularly " Histoire de la Medicine, &c. par Daniel Le Clerc," printed at Amsterdam, 1702, 4to. chap. xxxi. p. 232. where the authenticity of the papers referred to is examined at great length, and completely disproved. Indeed, the total silence of Thucydides in respect to Hippocrates' being at Athens, and his express declaration that " all human art was totally unavailing," seems sufficient proof that the papers called Τὰ ἐξωτικὰ by Foesius, in his edition of Hippocrates, are a fabrication by later hands.

The reader who may be curious to examine what Hippocrates has left concerning the plague, is referred to his treatise intituled τῶν ἐπιδημιῶν, or EPIDEMICS, Book iii. sect. 3. p. 166. Edit. Foes. he will there find a history of what Hippocrates considers a pestilential constitution, or condition of the atmosphere, generating plague; followed by some account of the symptoms, &c. of the disease, and a statement, more or less minute, of sixteen cases. These cases differ, in many striking particulars, as to the symptoms, duration, and event of the disease; of which the historian appears to have been no more than a looker-on. They are without date, either of place or year; and how useful soever they might be to a writer who should treat, generally, on the plague, deserve no consideration in relation to the subject of the present essay.

‡ DE RERUM NATURA, Lib. vi. p. 254. Edit. Barbou, (1754) ver. 19.

torian, some scattered passages from the Prognostics and Epidemics of Hippocrates, and superadding the wonderful embellishments of an ardent and vigorous imagination.

In the arrangement of symptoms, the order of Thucydides is not adhered to; both because, his account being historical, the method is not perfectly adapted to convey a connected exhibition of the disease, and because the variation now made will better enable the reader to compare the Athenian pestilence with those of Philadelphia in 1793, and New-York in 1795; the arrangement being nearly that of Dr. Rush, in his account of the former, and corresponding with the method pursued in the letters to Dr. Buel, on the latter.*

THE fore part of the year 430 A. C. was remarkably healthy; but whatever diseases existed at the time of the appearance of the Plague, were either banished by it, or assumed its livery. This disease broke forth suddenly. Its attack was, generally, sudden; commencing without any previous illness, or apparent cause. It began with violent head-ach, inflammation and fiery redness of the eyes; soon succeeded by inflammation of the throat, difficult respiration, and offensive breath. A sneezing and hoarseness followed, with cough and other pulmonary affections. But the progress and nature of the disorder will be more clearly comprehended, from the following disposition of the particular symptoms.

I. Thucydides has left us no observations to lead us to any minute information of the peculiar state of the *Blood-vessels*. Lucretius says there was hemorrhagy from the gums, fauces, and even the tongue; from all which a dark-coloured blood oozed.

II. Thucydides and Lucretius agree in describing the *breast* as severely affected. The former tells us that "the malady soon descended to the breast, with a violent cough."†

All had hoarseness, extremely difficult respiration, and offensive breath. "A great part," says Thucydides, "of the infected were "subject to such violent *hiccups*, without any discharge, as brought "upon them a strong convulsion, to some of short, to others of a "very long continuance."‡

* See Mr. Webster's Collection, &c.

† Lucretius says the HEART was affected. But the word COR, in this place, is intended to signify the STOMACH; and in this he coincides with Thucydides. See annotations annexed to Creech's Version of Lucretius, note on line 1114.

‡ From the words "without any discharge," one might suppose that the common hiccup, noticed in fevers, is not all that was meant by Thucydides. I observed in the New-York fever of 1795, a mingled hiccuping and belching; and there sometimes occurs in dispeptic cases a kind of belching with violent spasmodic motions of the stomach, not readily distinguished, by the inexperienced

The *brain* was remarkably diseased, during the whole of the sickness. Violent head-ach, and inflamed eyes, were among the first symptoms by which the disease manifested itself. A morbid wakefulness "never abated for a moment," which cannot be attributed solely to the extreme restlessness of the sick.*

III. The whole *alimentary canal* was greatly deranged. The throat and tongue were inflamed;† and vomiting of bilious matter was general, "with excessive torture." When the sick out-lived the usual period of seven or nine days, the disease fell upon the bowels, which became "violently ulcerated;" and the ulcerations "were accompanied with an incessant flux, by which many, re-"duced to an excessive weakness, were carried off."

IV. The *Secretions* and *Excretions*, in the plague, were much increased; particularly from the intestinal canal. But, notwithstanding what Thucydides observes of "discharges of bile" in vomiting, there seems no more reason for supposing any remarkable secretion of that fluid, in this disease, than in our fevers; in which it is generally thought to be augmented: perhaps without sufficient reason. On the nature of the alvine discharges, Thucy-

observer, from hiccups. The hiccup is commonly accounted one of the most unfavourable symptoms, and does not often appear, in our fevers, till the close of the disease. But the hiccup of the Athenians seems to have been of early occurrence, and extreme violence; nor is it noted as particularly fatal; but of nearly universal experience. Convulsions are by no means peculiar to the Athenian plague. Violent cramp of the extremities, with pains of the bowels like those of COLICA PICTONUM, often occur in Yellow Fever; and I have, myself, observed a true, but irregular TRISMUS, in that complaint, not entirely disappearing for several days.

* When they passed over the first 7, 8, or 9 days, which may be considered as the first stage of the disorder, Lucretius informs us that it took another turn, and sometimes appeared in the form of a pain of the head, with a profuse discharge of corrupted blood from the nostrils. Of this, however, Thucydides says nothing. Were it admitted as fact, it would seem that, in these cases, the brain was principally affected; and would therein offer another resemblance to our fevers.

In a girl, who had the yellow fever, the summer of 1796, the greatest violence of the disease was expended on the brain; which continued much disordered for 12 or 14 days. The disappearance of the cuma was attended by a dark discharge from her ears, one eye, and especially both nostrils. The discharge continued some days, gradually becoming light-coloured.

† The translator of Thucydides renders the words on which this remark is founded, viz. Καὶ τὰ ἐντὸς, ὅτε φάρυγξ, καὶ ἡ γλῶσσα ἐυθυς αἱματώδη ἦν. —"Within, the throat and tongue began instantly to be red as blood."— But the annotator on Creech's version of Lucretius translates the passage more correctly—"And inwardly their throats and tongues grew presently bloody." This difference is not material here; but it illustrates, confirms, and shews the origin of the remark of Lucretius, noticed under the first division in this arrangement of symptoms.

dides furnishes us with no remarks. The experience of most physicians will supply this defect, without recurring to the authority of Lucretius, who describes them as black, fœtid, and corrupt.—Nor may we place more confidence in his account of thin, salt, sparing, and saffron-coloured *sputa*, minutely copied from the Prognostics of Hippocrates.

The *sneezing*, noticed among the first symptoms of the disease, was probably accompanied with the usual increased discharge from the nostrils.

V. The hiccup, convulsions and morbid wakefulness, already mentioned, indicate the diseased condition of the *Nervous System*.

Thucydides enlarges, with consummate eloquence, on the terrible influence which this calamity exercised over the minds of his countrymen. As no treatment afforded any certain relief, and as the disease spared neither age nor sex, few dared to yield assistance to their friends; and when some generous spirits flew to the relief of others, it was in a fit of despair, with the expectation, or determination, of sharing their fate.—A dubious and destructive war agitated the minds of all. Pent up within their walls, destitute of employment, they saw their friends perishing around them, and a merciless enemy laying waste their territory, and threatening them with famine.—The melancholy emigrants from the country beheld their possessions desolated, their houses devoted to the flames, and themselves menaced with utter extirpation; while neither the consolations of affection, the prospect of speedy succour, nor the comforts of food and cloathing, of lodging and attendance, were extended to their relief.—A superstitious horror seized on every heart, and weighed down every spirit, when they remembered the interdictions of the Oracle. They shuddered when they saw the pestilence depopulate the *Pelasgic*, on which they had impiously erected their miserable dwellings; and imagined, in the dreadful calamity that opprest and overwhelmed them, the effects of the vengeance of the offended Gods. But, "whatever supplications were offered in the temples, whatever "recourse to oracles and religious rites, all were unavailing." At length, with the hope of favourable change, regard to decency was lost. An utter depravity of morals extended itself with the disorder; aided it, in all its ravages; and exceeded it, in the measure of its desolation.

In the sick, "dejection of mind constantly attended, from the "first attack;" and after some continuance of the disease, and when its operation was well understood, those who were seized with it instantly relinquished every hope, and surrendered themselves to an expected death in silence and despair.

Such were the affections of the mind, during the continuance of the disease, in the sick and well.—A frequent consequence was a loss of Memory; and oftentimes an incurable Fatuity. "Some," says Thucydides, "who quite recovered, had at once totally lost "all memory, and quite forgot not only their most intimate friends, "but even their own selves." And this serves to confirm our opinion that the Brain suffered great derangement in the plague.

VI. It is probable, from the affections of the head and eyes, and even asserted by Lucretius, that the *vision* was impaired. Some recovered with a total loss of the substance of the eyes.

The condition of the nostrils and fauces, doubtless, impaired or destroyed, for the time, both *smell* and *taste*.

The *appetite for food* is no farther noticed by the historian, than to inform us that no kind of diet seemed to have any curative effect.

The patient's *sense of heat* and *thirst* were intolerable; and so painful as nearly to occasion madness. Though the skin did not seem hot to the touch of the by-standers, yet in the patient it appeared to inflame his whole body. The heat was so excessive that the sick could not bear the slightest covering, or finest linen; but lay naked, in the streets, and even in the wells and cisterns, if they could get into them: hurried away no less by this dreadful heat, than by a thirst at once insufferable and insatiable. "For, "whether they drank much or little, their torment still continued "the same."

VII. The ulcerations and discharges from the bowels before mentioned, seem connected with some derangement of the *lymphatic system*.

When the patient outlived the first stage, and the disease did not expend its force on the intestinal canal, there seems to have been an absorption of the pestilential fluids, perhaps from the bowels, which were carried into the circulation, and deposited on particular members. In this case, it affected the fingers, toes, and genital organs; and many recovered from the plague with the loss of these parts. Lucretius intimates, that their lives were sometimes preserved by amputation of the organs diseased. "*Vivebant ferro privati parte virili.*"

VIII. The *skin* was not hot to the touch; neither was it cold, nor pallid—"but reddish, livid, marked all over with little pustules "and sores."*

* Lucretius compares the appearance of the skin to that occasioned by ERISIPELAS; and says, that no excessive heat was to be discovered even "IN SUMMO ARDORE:" by which I conjecture him to mean in the exacerbations of the fever.

IX. The plague of Athens appears to have been an acute and continued fever; terminating fatally on the seventh or ninth days, for the most part; but if longer continued, falling on the intestines, in the form of dysentery; or affecting the extremities and genital organs.

When the disease lasted only seven or nine days, there was very little visible waste of the body, and "the strength was not exhausted."* When protracted, in the shape of dysentery, it commonly proved fatal; exhausting the patient, and reducing him to the extreme of weakness and wasting. When the disease fell upon the extremities, &c. (and, according to Lucretius, when a discharge of dark-coloured and fœtid matter happened from the nostrils,) it seems that the sick commonly recovered.

But, though the fever was usually continued, this was not uniformly the fact. Sometimes it was lingering, and had intermissions. This was its appearance in the case of Pericles; whose body had, probably, been prepared by degrees; and previously worn down by fatigue and grief. He was one of the first victims to the second increase and violence of the plague; having escaped it for three years and a half; and it is probable that the calumnies of his enemies, the ill success of some of his enterprizes, the ingratitude of one of his sons, and the death of the one most worthy of his love, and of whom he was doatingly fond, predisposed him to be affected.†

X. The old and young, males and females, the robust and feeble, were equally exposed to the disease, and equally destroyed by it.

No medicine appeared to have any effect in relieving the pains, or in hastening or promoting recovery.

No person had the disorder twice; or rather none were re-infected.

Those who removed from the country suffered most; not merely because they were worse accommodated than the town's-people, but from so total a change in all their habits.—The historian brings their sufferings before our eyes in a masterly manner.—"As they "had no houses, but dwelled all the summer season in booths, "where there was scarce room to breathe, the pestilence destroyed "with the utmost disorder, so that they lay together in heaps, the

* I have uniformly observed in the yellow fever, that few recover who are able to walk about as late as the 5th or 6th day of the disease; when no previous medical assistance has been afforded them. Indeed it may be confidently affirmed that, where such vigour remains in the muscles, it is not the vigour of health, and the vital parts are proportionally diseased. This unnatural appearance of strength is like that produced by intoxicating liquors: the poison of contagion is meanwhile busily undermining life.

† See Plutarch—Life of Pericles.

" dying upon the dead, and the dead upon the dying. Some were " tumbling one over another, in the public streets, or lay expiring " round about every fountain, whither they had crept to assuage " their immoderate thirst. The temples, in which they had erected " tents for their reception, were full of the bodies of those who " had expired there."*

It is perhaps impossible to make any estimate which may be depended on, of the number of persons who died of the Athenian pestilence. The disease continued four years and a half from its commencement; during three years of which time, the mortality was constant. For eighteen months it abated, but was not extinct. Thucydides, when he mentions the disease the last time, gives an imperfect account of the number of deaths. Whether this account is meant to include the whole, or only those who died in the last year of the plague, is uncertain. Probably the whole is meant of those who died at Athens; but it is still doubtful whether he computes the loss sustained by the troops engaged in foreign service. In this dilemma we can do no better than to quote the words of the historian himself, in the language of his translator:— " It appeared, from the muster-rolls, that there perished 4400 of " those citizens who wore heavy armour, and 300 of the horse- " men. The number of the lower people who died was not to " be computed."

It remains for us to assign some probable reasons for the cessation and disappearance of the pestilence whose history we have been considering. These will be found in the following circumstances, which preceded and accompanied its departure.

1. The whole people of Attica, with the exception of such as were employed in the armies and in the garrisoned towns, had been included within the walls of Athens for near six years. Though habitually addicted to a country life and vegetable diet, from which they had been mostly restricted, they must, in so long a period, have gained, in some measure, new habits, become reconciled to their mode of life, and gradually hardened against the operation of contagion.

2. Numbers had recovered from the disease; and as none were twice affected, they enjoyed an immunity from its attacks.

3. Several thousands of their countrymen had fallen in battle; many were captive, in other countries; they had garrisons in seve-

* Compare the situation of these people with that of the Irish emigrants to New-York, in 1795. See the Rev. Mr. O'Brien's letter to Mr. Bailey, in his account of the fever of 1795, page 89.—Of more than 700 persons who died in New-York, in 1795, only 190 were citizens. See Webster's Collection, last page.

ral of the foreign states; armies in others; and a prodigious fleet, full of mariners and soldiers, triumphant over the sea. This diminished the number of inhabitants in Athens; and allowed more room, and a greater quantity of suitable food, to those who remained.

4. Many thousands fell victims to the plague; and the deaths were chiefly among those who were most crowded together. Opportunity was thus given for those who survived to acquire better lodgings, and better accommodations of every kind.—It is probable that the deaths by war and disease, and the space vacated by the armaments abroad, diminished the population at least a third.

5. The same season that the plague broke out a second time, Athens, Eubea, and all the neighbouring country, felt the shocks of successive earthquakes. The next spring, new earthquakes happened, so as to deter the Peloponnesians from entering Attica. The sea broke over the land in Eubea, and on the continent, a little above Athens.—This was the last year of the plague. The next season (year 425) was very tempestuous; and though the Peloponnesians entered Attica, yet they came so early as to do very little damage, and were obliged to retire after a stay of only fifteen days. They never repeated their incursions; and the next year another earthquake was felt. Is it not probable that such a succession of tempestuous seasons, materially affected and altered the atmosphere of Attica and Athens?

6. But, perhaps, the most material advantage derived from these stormy seasons was, that they put an end to the blockade of Athens, and to the war on the land-side. Thus the people were, once more, allowed to issue from the city; to re-visit the deserted country; re-erect their rural habitations; extend the cheering and beautifying hand of cultivation to the desolated and afflicted fields; to crown their heads with chaplets, and their boards with fruits. —The last ravages of any extent, committed by the Peloponnesians, were in 427; they were deterred from renewing them in 426; and the pestilence ceased with that year.

THE history of the *Plague of Athens*, now concluded, offers so many points of resemblance, both in its nature and origin, to our own fevers, that we may be justified in declaring it to have been, in all essential particulars, the same disease. A minute comparison, should it display minute dissimilarities, could scarcely

fail of presenting as many minute similarities; and a due consideration of every circumstance cannot but impress the mind with a deep conviction of the unity of cause, in ages so remote. This point, so well established, ought to make us careful how we overlook the more obvious sources of pestilential diseases, in our search after those which are foreign and remote. If local causes originated a pestilence in Athens, local causes may generate a Yellow Fever in Philadelphia and New-York. To these, then, be our attention more scrupulously directed; and let us be more solicitous in the inspection of our houses, yards, streets and docks, than of cottons and woollens, of vessels from the West-Indies, and ships from the Mediterranean.

ARTICLE II.

REMARKS ON MANURES:

Wherein, by an Inquiry into the Nature of Septon, (Azote) *and its Relations to other Bodies, it will be seen how nearly* Physic *and* Farming *are allied to each other. Intended as a Sequel to Judge* PETERS's *Agricultural Inquiries on Plaister of Paris. By* SAMUEL L. MITCHILL, *Member of the Legislative Assembly of the State of New-York, Fellow of the Royal Society of Edinburgh, Professor of Chemistry, &c. in Columbia College, &c. &c.*

IT will appear from a perusal of a great number of books, that an opinion, grounded on fact and long observation, has, from early ages, prevailed among writers, that there was something of an *acid* nature produced in the atmosphere. The names they gave to this acid shew, that the principal and most respectable notices about it, were tinctured with much conjecture and uncertainty. Sometimes it was called *acidum primogenium*, because it was imagined to be the first-formed acid, and that other acids derived their qualities in some measure from it; then it was called *acidum universale*, on account of its existence so generally where the business of men was carried on; again, it was termed *acidum vagum*, as it seemed to stray and wander about through air and water, attaching itself now to one thing, and then to another. It was by some denominated *acidum atmosphericum*, from its presence and universality in the atmosphere; and by others, *acidum aëreum*, by reason of the gaseous or volatile form it assumed while flying about, or floating along with the winds. And when artificially prepared, by disuniting it from pot-ash, with which it loved dearly to associate, it has since received the more specific and determinate names of the *nitrous and nitric acid*. The learned examiner will pretty readily discern, that the fact intended to be expressed by these various terms had, from an early period of history, attracted the attention of mankind; and that, in expressing their sentiments about it, while all agreed it was an acid, different names were given to it, according to the guess and fancy of each observer. And it may also be collected, that under the enumerated terms, were contained not only the effects truly ascribable to the vaporific or nitrous acid, but, through want of discriminating an analogy then not understood between it and certain other acids, the names employed, embraced likewise a number of phenomena, which more recent science has traced to the operation of *oxygenous air*, and

carbonic acid air. It appears to have been a favourite notion of some acute investigators, that there was not only a generally-prevailing principle of acidity, but that acids formed by it, were, to a certain extent, at least, convertible into each other. Experiments, indeed, upon the acids afforded by vegetables, countenance the idea of the radical similarity, or perhaps sameness of the acid of tartar, vinegar, sugar and must. (CRELL. Chemische Annalen, &c. Chemical Essays of C. W. SCHEELE, Ess. xxiii.) But it was surely carrying the business too far, to affirm, with INGENHOUSZ, (2 Experiences sur les Vegetaux, § xvii. p. 110.) so late as the year 1789, in asseveration of an idea often maintained by others before him, that the aerial acid (by which he meant carbonic acid, or fixed air) may be a wandering "acid, (acide vague) convertible into "every other acid," and "all other acids convertible into fixed "air; and that these considerations might give us new light con- "cerning the regeneration of the *nitrous acid* in earth, from which "it had been wholly extracted."

The whole of modern experience on those subjects goes to the establishment of these points, that vital or oxygenous air is composed of heat, oxygene, and light; fixed air, or carbonic acid, of heat, oxygene, and charcoal; nitrous acid, of heat, oxygene, and septon; and phlogisticated air or atmospherieal mephitis, of heat and septon. Nitrous acid may therefore be resolved into two distinct airs; to wit, *oxygenous air*, when the principle of acidity quits its septous basis, and flies off with heat; and *atmospherical mephitis*, when the septon deserted by the substance from which it derived its sourness, turns to a gas with the matter of heat also; and, on the other hand, it is equally clear, that the two airs, which in their distinct state, (JACQUIN, Commentar. de rebus, &c.) constitute the atmosphere, may unite their basis chemically to each other, part with a portion of their caloric, and form the nitric or atmospheric acid. The idea of the convertibility of fixed air and nitrous acid into each other, as they are radically and totally distinct, is conjecture without any probability whatever to support it; though I see no improbability in the association of septon and carbone, in such a manner as to form with oxygene, an oxyd or acid with a double base, which I suppose to be one of the modifications of those animal poisons called *specific contagions*.

As the words poisons and contagions have been mentioned, I shall observe, that septon and oxygene most probably enter into the composition of the whole of them. From chemical combinations of these, acting upon different parts of the body, seem to spring the common symptoms of fevers, dysenteries and plagues. And thus, a clear idea can be entertained of the nature and composition of *common infection*. But, as there are some distempers of a nature that have been called *specifically* contagious, their constitu-

tion may be conceived, by supposing the matter of small-pox, for instance, to derive its peculiar quality from a commixture of carbone, with the matter of ordinary contagion; that of syphylis, to arise from phosphorus, blended with the septon and oxygene; that of measles, from a combination of sulphur; that of pertussis, or croup, from the addition of the unknown radical of the muriatic acid, forming a nitro-muriatic oxyd or acid vapour, &c. and, in like manner, may conjectures be found about the poisonous matter of rabid and other animals.

I suggest these things in this place because there is reason to consider all these compositions of atmospherical and animal matter, as good manures.

If any reliance is to be placed on INGENHOUSZ's experiments, we must admit that a great number of growing and healthy vegetables during the prevalence of darkness, emit from their leaves septous (azotic) air (2 Experiences sur, &c. sect. vii. and ubiq.) A fresh cabbage leaf exposed to air for a night, is said to have mephitized it. But whether these are true relations or not, it is admitted by all parties, that *some* plants, when they ferment or rot, afford azotic air. The question now to be examined is whence the vegetables that exhale azotic air when alive or emit it when dead, originally derived the azote (septon) or basis of that air?

If can be shewn that there are manures that contain septon, that this frequently evaporates with heat in the form of septous (azotic) air or combines with oxygene into septic (nitric) acid, or rises to a small height in the form of nitric (septic) acid gas, then it will be evident what the sources are whence vegetables may derive it.

Now the belief of mankind from a very early period of ancient history has favoured the existence of a primitive and universal acid, existing at almost all times and places, and performing great things in the economy of this world. The experiments of the moderns have established the truth of this opinion, by ascertaining that, by a law of nature, the septon of those plants and animals which contain it, does, during the putrefactive decay of such organized substances, very commonly unite with oxygene, and form the acid of putrefaction, or the nitric acid. And as all living systems, whether of plants or animals, must die and undergo dissolution, such a mass of putrifying materials, corrupting at all times and in all places, will generate enough of septic (nitric) acid to countenance the ancient idea of the universality of its existence. It is, therefore, the most abundant and most active of all acids, at least as respects man and the various objects with which he is conversant, on or near the surface of the earth.

Among other effects which oxyds and acids of this sort seem to produce, when volatilized by heat, they float about in the atmos-

phere, *endemic* and *epidemic* distempers deserve to be particularly mentioned. Accordingly, sickness of one or other of these denominations has been always remarked to prevail where putrefaction and corruption abounded, where septic vapours contaminated the atmosphere, and where the bodies of living animals inhaled them in sufficient quantity. Hence, it has been remarked, that in countries or places where the atmosphere possesses vital air enough to support the life of animals, and is not infected with such a quantity of septic and pestilential vapours as to induce sickness, and shorten the lives of the inhabitants, that vegetables thrive well. This state of moderate purity, appearing to be best adapted to the convenience of both plants and animals. But in situations where a soil, over-rich with moist and putrid materials, exhales its septic and unwholesome steams, and excites agues, fevers and plagues, there it often happens that vegetation goes on vigorously, and in proportion to its luxuriance, lessens, by converting to its own use, the quantity of pestilential matter in the soil and air. While on sandy, mountainous, and rocky places, where only small quantities of putrid substances can collect, where the atmosphere is little or not at all poisoned with their exhalations, but the respirable portion of it is unusually large, in such circumstances plants thrive but poorly.

These general remarks, which I take to be facts, have not, that I recollect, been well explained: physicians, by confining themselves too strictly to the narrow views and pursuits of a profession, have seldom written the history of endemic and epidemic diseases as they ought to be written. They should have dwelt much more at large than has been generally done on concomitant and surrounding events, as well as the detailed enumeration of symptoms, and prescriptions. In discussing these subjects, the persons who made it a profession to study the constitution of man, have thought it beneath their dignity to seek information from their brother physicians, who superintend the health of such mean objects as brute animals, and plants. But it is vain and idle to separate, in speculation, events which the unchanging order of things has connected indissolubly together. Amidst the darkness which overhangs this subject, physic will find it impossible to read a page of the book of nature, unless agriculture lights and trims the lamp.

Supposing, then, that septic acid vapours contaminate the atmosphere, and destroy men and other animals, these must undergo decomposition after death, and enlarge the mass of putrefying materials. Every carcase added to the heap, increases, with regard to plants, the quantity of aliment, and, with respect to mankind, augments the bulk of poison.—An inquiry into the particular phenomena which a country sickly by reason of its fertility, or a dung-heap unwholesome on account of its richness, presents to

the mind, will go a great way toward elucidating the history of azote, or the principle of putrefaction in manures.

There septon (azote) exists in one or other of these forms:

1. Pure or uncombined septon.
2. Septon converted to an elastic fluid by caloric, and existing in the form of azotic gas.
3. Septon, combined with a small portion of the principle of acidity, but not oxygenated highly enough to become acid, turned to a gas by heat, and existing in the form of dephlogisticated nitrous air.
4. Septon united to a large portion of oxygene, and exhibiting itself in the form of nitrous gas.
5. Septon charged with yet a larger dose of the principle of acidity, and assuming the form of aqua-fortis, or smoking nitrous acid.
6. Septon still more highly oxygenated, and becoming the septic, nitric, or dephlogisticated nitrous acid.
7. Septon combined with a yet greater proportion of oxygene, and converted by heat into a gazeous form, and thus becoming the septic or nitric acid air or vapour.
8. Septic acid in weak commixture with water, as in certain dews and fogs, and in showers attended with sharp lightning.
9. Septic acid acting upon timber, horns, bones, leather, shavings, straw, rags, and other substances, strewed over fertile soils, or entering into the composition of manure.
10. Septic acid joined to pot-ash, and forming the nitre or saltpetre of soils.
11. Septic acid united with soda, and making quadrangular or cubic nitre.
12. Septic acid associated with lime or calcarious earth, and constituting calcarious nitre.
13. Septic acid acting upon volatile alkali, and affording nitrous ammoniac.
14. Septic acid in conjunction with clay, and, by their union, giving rise to alumen nitrosum.
15. Septic acid combined with oil, and turning it black, by virtue of its own partial decomposition, as in foul soap suds, &c.

In this enumeration are included the principal compositions of septon with other bodies which relate to agriculture. A few remarks on each of them will illustrate the respective value of each, and its relation to other things. On the first five there will not be a necessity of offering much. For,

1. Whether we consider the ultimate particles of matter as solid and indivisible atoms, or as mere mathematical points, endowed with attractive and repulsive powers, such is their extreme minute-

ness or tenuity, that they evade all examination. Septon is one of those subtle and fugitive things which has never yet been obtained distinct from all other substances, and examined by itself. There is, however, no reason on that account to doubt its existence, because it enters largely into the constitution of the blood muscles, and lean parts of animals; and on its union,

2. With caloric, or the matter of heat, it takes upon itself an aërial form, and constitutes that sort of gas which some experimenters suppose living and healthy plants emit, during the absence of sun-shine; the same species of air of which the greater part of the atmosphere consists, and by which growing vegetables are incessantly surrounded. If what are called their tracheæ, or air-vessels, take in air at all, doubtless a portion of this particular kind is absorbed.

3. If the septous or azotic air, just mentioned, has dissolved a very small portion of oxygene, so as to oxydate, but not acidify it, a very singular sort of gazeous compound is formed, whose operation, in agriculture, has never yet been properly investigated.

4 and 5. Septic gas and septous acid are never found to exist for any considerable length of time, in the open air; but of all the compounds formed by septon with oxygene, these two are the most frequent in laboratories, and are the subjects of the chief experiments in science and the arts. They are artificial productions, and must be kept in closely-stopped vessels. Their existence, during exposure to the common atmosphere, is only momentary; for they both absorb oxygene so greedily as very soon to turn to pale and colourless septic (nitric) acid, which is the ordinary and most natural form they assume. As the qualities of nitrous air and aqua-fortis are very different from those possessed by the more highly oxygenated acid, the experiments upon the two former, and the reasonings upon them, are not to be applied to account for the phenomena of the latter. A practice too frequently done, to the bane and detriment of science! As they can only exist when closely stopped, so they can have no influence on manures and soils, nor on the constitution of plants and animals. And whenever they can find oxygene they attract enough of it to turn to septic acid.

6 and 7. The nitric acid, and oxygenated nitric acid vapour, are the forms in which septic compounds most commonly and universally exist. In these states, pale, colourless, and possessing in their sparse and dilute condition, few obviously-striking or sensible qualities, mankind observed enough of them to be prompted to make vague conjectures about something acid, but knew too little to form any correct opinion on the subject. The former may be produced whenever septon and oxygene come into chemical union. By the effect of lightning in the clouds the basis

of the two gases, constituting our atmosphere, seem to be made to unite, and thus produce the septic acid, with which the rain-water of thunder-showers is tinctured. During the putrefactive process of much animal matter which abounds with septon, the oxygene of the corrupting bodies themselves, or of the water in or near them, or of the circumambient air, joins with that basis, and forms the acid of putrefaction. And while corruption of such vegetable bodies as contain septon, is going on, an acid with the same radical is produced. Yet we constantly find in the books, this acid classed with *fossil* bodies. Even in a book printed as late as the year 1791, from a compilation of so well informed a man as the ABBE ROZIER, (1 Cours complet d'Agriculture, tit. Acide, p. 231.) no mention is made of this, as of animal extraction, but it remains preposterously ranked with *mineral acids.* This notion is the cause of much misconception and error in estimating its qualities and operation. It is wholly immaterial from what body the septon and oxygene are derived; whether they are furnished by the animal, vegetable, or aërial departments of nature, they may enter into chemical union by putrefactive and electrical aid, and constitute the atmospheric or primogenial acid. The septous and oxygenous gases of the atmosphere are, in ordinary circumstances, perfectly disunited; but when their bases are associated by chemical attraction, they form the new product now under consideration. These same radicals, constituting a part of vegetables and animals, do very commonly get within the sphere of each other's attraction, during the disorganization of such bodies, and form a similar composition. Hence the universality of such a production can be readily comprehended, and a reason be given for the greater prevalence of it, in and around the bodies and habitations of men, especially the carnivorous and unclean:—and wherefore, as all living beings must die and be disorganized, the quantity of septon united to oxygene, during such processes, must be prodigious, and surpassing all estimation.—Where large quantities of this compound are produced, and the ground, after the evaporation of its moisture, becomes hot and dry, the septic acid will be converted to a gas, and in the form of vapour, pervade the atmosphere near the earth's surface. As its qualities, when acting upon many animal bodies, are caustic, corrosive, inflammatory, and suffocating, it very commonly incommodes or destroys such of them as live near its source or manufactory; exciting, by its venomous properties, agues, fevers, anguish, catarrhs, diarrhœas, dysenteries, eruptions, plagues, &c. according to the degree of concentration, to the quantity applied, the length of time for which its action is continued, the susceptibility of the constitution it fixes upon, the part of the system now particularly invaded, &c. &c.—From this history of the genera-

tion and growth of these pestilential fluids, it would seem that, in process of time, the salubrity of the atmosphere would be destroyed, and the oxygenous and septous gases forming it, lose their distinct forms, and coalesce into nitric acid and its vapour. As far as I can judge this would really happen, was it not that there are various ways whereby this acid is neutralized and decompounded. Some of these we know, and others there probably are, though as yet unknown to us. As the septic acid and its vapours never constitute the nourishment of plants, but in conjunction with other substances, it will be proper to dwell a little upon these. The examination of these facts will explain by what economy of nature this acid is neutralized, and its noxious and pestilential vapours repressed. And, at the same time, it will give a tolerable idea of the manner in which the compounds formed by it, with different saline and earthy bodies, contribute to the fertilization of soil, and the thriftiness of vegetation. In doing this I shall endeavour to follow the method of nature.

8. From the analysis of rain-water, by BERGMAN, and other able Chemists, it is found to contain a small portion of this acid; and it is probably more owing to this than to the presence of fixed air, that this kind of water, especially during showers, accompanied with lightning, becomes turbid by mixture with lime-water, as SENNEBIER observes, while common rain-water exhibited no such appearance. In these cases the septic acid formed by the electric flashes in the clouds, seems to unite with the lime into calcarious nitre. The use of this acid in vegetation is proved by the experiments of HOME, who found a diluted mixture of nitrous acid in water to be a good manure for certain gramineous plants. This acidulous tincture of rain-water then, may be considered as a bountiful provision of nature, to supply the gramina, which afford pasture and forage as well as those which yield bread-corn with a nutritive material, in every shower which besprinkles the face of the earth during summer. This view of the subject too, indicates one of the great and beneficial uses of electric explosions in the atmosphere. But while this diluted acid refreshes and feeds the vegetable world, it has often been remarked to operate unhealthily upon human constitutions; many men being subjected to febrile indispositions, after exposure and soaking in such falls of rain.

Facts from all quarters prove, that the septic acid generated by putrefaction, is always on the earth's surface, and its vapours never rise to a great height above it. From these exhalations, the water of dews, mists and fogs, precipitated when the atmosphere is cooled, particularly during the night, receives a portion of the same acid, which thus united, attach themselves to animal and vegetable bodies. Exposure to water so impregnated, causes the most violent distempers in the southern latitudes, and is followed by almost

certain destruction of human life in many places. The dew, bringing down with it as it falls, pestilential matter enough to poison the constitutions of men in a single night; nor, in these cases, do the bodies of men only suffer. I am strongly led to believe, that too great a quantity of this material, or too frequent a repetition of it, even in our own climate, is a common cause of blasts, blights, and mildews in our harvests. Too much of this matter deposited upon plants, stimulates them excessively, and makes them sickly. And the diseased spots so often observed, when drops of dew have long remained upon the leaves and fruit of trees after the watery parts have been evaporated, seems to evince the operation of some venomous and caustic substance left behind to work such injurious effects. It is well known, that some of the mildews are accompanied with multitudes of microscopical plants growing upon the blighted spots, and these parasitical productions have been thought to be the cause of the malady of the plants on which they grew. The more just opinion is, that the mildewed plants, the wheat, for instance, first grew sickly, by the corroding and scorching effect of too much septic acid precipitated with the dew; and after certain spots were discoloured and mortified by its action, the growth of little funguses spouted forth from the distempered part, and are an effect, not a cause of the mischief. They, therefore, injure the plant on which they grow, not by converting its juices to their own nourishment, but their presence serves as an index to shew the mildewed vegetable was injured before. The quantity of this manure, which falls in common rain and dew, seems very nicely proportioned to what the economy of vegetables can receive with advantage, and that of animals can bear with no considerable detriment; while the proportion of it descending with dews in certain highly contaminated conditions of the atmosphere near the earth, may not only disturb the health of animals, but, by their excessive strength and stimulation, work destructive effects upon vegetables themselves. The proneness of metallic substances to rust, and the restoration of their former qualities, to exhausted nitre grounds, by the influence of such dews, give countenance to this mode of reasoning on the facts. Thus it appears, that certain plants, among which may be reckoned, perhaps, all the gramina, tetradynamia, and *fungi* of the botanists, and all such as by their analysis are found to contain septon, derive it from the septic acid, which, in its very weak state, they seem capable of inhaling without detriment. This acid is very easily decomposed. Its basis, the *septon*, is retained in such a proportion, as the economy of the plant requires; on the decomposition of the acid within the plant, the surplusage is discharged in the form of *mephitic* or *azotic air;* while its *oxygene*, after having supplied as much of that ingredient as is needed, sends off its overplus, to make a junction with *light*, and constitute *vital*

air. The doctrine now stated, as connected with rain and dew, is equally applicable to the septic acid formed in dung-heaps, stables, duck-puddles, muck-holes, &c. where a moderate quantity of it acts as a fertilizer, but too much induces sterility, by burning up all before it. A recollection of the facts relative to over-manuring with such substances will evince the high probability of this reasoning, and lead to a true theory of ashes and lime, as manures and neutralizers. And do not pond-water, brook-water, and swamp-water, owe a part of their enriching quality to the presence of the same septic compound, produced from the animal and vegetable matter decaying within them? Do I go too far in ascribing, in part, to vegetables, the correction of that taint, which, if not kept within due limits, might give, at last, to all the waters of the globe, as venomous qualities as those of ponds and marshes have been long found to possess? Am I wrong in believing, that, on the exhalation of the water, the septic effluvium rises into the air, and makes the neighbouring inhabitants sick; because, in such cases, the vegetable economy cannot decompound it, and there is no sufficient neutralizer on the denuded surface of mud, to keep it from rising?

Be these things as they may, there is evidently a connection, within certain bounds, between the fertilizing quality of water upon plants, and its moderately hurtful operation upon animals; and beyond those limits, both classes of beings become distempered and die, by its action. The septic acid appears to be the material, which, according to its quality, strength, mixture with water, and extrication from it, &c. produces these, amidst a variety of other effects.

9. Among other memorable changes wrought by the septic acid in mixture with water, those it works upon the putrifying materials of the heap wherein it is produced are by no means the least considerable. This acid is one of those substances which the makers of experiments have been pleased to call *antiseptic*, from its power, in some instances, of resisting common putrefaction. From the overcoming of this acid in manures, by lime and alkalies, it has probably happened, that these latter substances have been termed septics, or promoters of putrefaction. This is a deceitful statement, for alkalis resist corruption as powerfully as acids do, and, if possible, in a higher degree. This notion of the septic quality, and tendency of calcarious earth, has led to a world of mistake and misconception concerning lime as a manure. Lime, it was said, by the septicity of its nature, disposed manure to rot. This assertion, made, I believe, first by Sir JOHN PRINGLE, and repeated by almost every writer since, appears to have no foundation in truth. PRINGLE's Doctrine of *Septics* and *Antiseptics*, is full of false philosophy, and has done abundance of harm. It is the source

whence most of the erroneous ideas current now a-days, about those classes of objects, are derived. The operation of lime, when thrown among common manure, is to combine with the strongest acid the heap contains. This is usually the septic or acid of putrefaction, which, if quick-lime be added, neutralizes it without effervescence; if mild lime be thrown on, combines with it, after expelling the carbonic acid or fixed air. The product in both cases is calcarious nitre, whose qualities I shall examine further by and by. If lime and alkalies are considerable promoters of putrefaction, it must arise, saving their transient effect when in their caustive state, from their taking to themselves and saturating so strong an antiseptic as the nitric acid of the manure. But this conclusion also is fallacious; for the nitric acid, antiseptic as it is, is known to be a great corroder or disorganizer and destroyer of a great variety of things. There is formed from the softer and more perishable parts of organized bodies, an acid liquor, possessed of qualities capable of breaking down or eating away the texture of the most compact and durable. Thus, both in the grave and the dunghill, by the operation of the acid of putrefaction, the firmness of bones is dissolved, as it expels the acid of phosphorus, and associates itself with their calcarious basis, in the form of a calcarious nitre (nitrite of lime): Thus the tougher compages of horns is by slower degrees made to yield to the same powerful menstruum; in like manner the skinny parts of animals, whether crude or tanned, lose their cohesion by the destroying effect of this offspring of corruption; by the same means, the solid coherence of wood and timber is forced to crumble down and waste away, at a rapid rate, in all places where water and putrid vapours, near the surface of the ground, can act with full effect upon them; the accelerated corruption of shavings, straw, and rags of linen, cotton and wool, added to animal manure, leaves little or no doubt that their more rapid disorganization in such cases proceeds from the nitric (septic) acid by which they are penetrated. Such seems to be the operation of septic acid, as it co-operates with other causes, in breaking down the nicely-wrought and finely-fabricated works of animated machinery. And every other thing would be obliged to yield to its rapacity and violence, had it not been so provided, that this arch destroyer should become glutted and saturated with conquest, and unable to pursue the work of destruction any longer.

10. After this triumph over every thing delicate or beautiful exhibited in the composition of the solid and more durable parts of organized matter, the acid rises from its mass of ruin, for lack of farther employ, and proceeds through the air to the neighbouring places. In this state it often meets with the bodies of men, and attempts to carry on, in all it meets, the accustomed

process of destruction. Hence arise distempers of different malignity, in proportion to circumstances favourable, or, otherwise, to the operation of the poison imbibed. Hence the unhealthiness so often complained of and commented upon, of the steams issued from large collections of rich manure. But active and volatile as they are, there are substances which have power to coerce and restrain them; to disarm them of their ferocity, and make them calm and gentle. The chief of these is pot-ash, or the vegetable fixed alkali, that saline substance which is afford by the incineration of plants; that which in the shops is called salt of wormwood and salt of tartar. The union of the septic acid with this alkali, forms the septite of pot-ash, the very salt commonly known by the name of nitre and salt-petre, and from which this acid has almost always, to the great injury of science, borrowed the name of nitrous. It is not essential to the present inquiry to determine the controverted question, whether pot-ash is a simple and elementary substance, or whether it is a compound body, formed in the fire during the combustion of wood. Of all bodies existing where putrefaction goes on, this salt has the strongest attraction for the acid of putrefaction. Consequently the acid will quit its connection with all other substances, and attach itself to this alkali. The extent to which this takes place will determine the quantity of salt-petre produced, and the quantity of septic acid neutralized by it, and taken out of circulation. Pot-ash then acts in a beneficial and wholesome manner, by repressing and keeping down that fluid which, by rising in vapour, might occasion intermittent fevers, or, according to its degree of malignity, others of a more alarming nature, and even pestilence itself. It will be found accordingly, that the region of unhealthy exhalations of this kind, is that where the substances on the earth neutralize this destructive acid either partially or not at all. As far as pot-ash is concerned in this process, it appears that there are some soils and tracts of land in the world, where it is native, or is an original material. By absorbing from rains, dews, and putrid bodies, all the acidity they can impart, these beds of pot-ash change to nitre, which is in many places artificially extracted from the earthy matter with which it had been mingled and manufactured for use in several parts of Asia. This is the case in certain parts of Europe. But where nature has not bestowed a store of pot-ash to the earth, that salt is frequently accumulated there from adventitious and secondary causes. Near the settlements of men, pot-ash is generally produced by the agency of fire; and wherever soap is employed to aid common water in rendering substances clean, a quantity of alkali is thrown away with those solutions that have served the purposes of washing. Perhaps, too, as pot-ash seems to be a constituent part of some plants before they are subjected to the operation of fire, a portion of it is extricated by common pu-

trefaction. From these sources the earth, in the neighbourhood of human dwellings, and more especially large cities, becomes oftentimes highly nitrous. Where animal and vegetable matter accumulates, something of such a process may be expected to go on. This is so much the case, that TOURNEFORT relates, "the people "of some parts of Armenia carefully collect the dirt of the great "roads which are frequented by caravans of camels, which they "wash, and extract from it considerable quantities of nitre; while "the earth of the neighbouring fields yields no nitre." (Voyage au Levant, letter vii.) It would be needless to quote from LANCISI, that nitre is found in the soil of Rome; from BOURGOANNE, the abundance of it around Madrid; and other authorities proving the plenty of it in all the villages of Prussia. It is sufficient to say, the universal acid which joins the pot-ash forms nitre, and is subservient to the purposes of agriculture and the arts, when on the earth; but, as HUXHAM seems to have conjectured, (1 Observ. on Air, preface, p. xx.) oftentimes excites sad disturbance in the animal economy, and kindles up epidemic distempers after its elevation into the atmosphere. The operation of pot-ash, then, whether in the form of common ashes, tartar, soap-suds, &c. is twofold, 1st. It forms salt-petre with septic acid in the earth; and, 2dly. It consequently fixes the acid so that it can by no means rise in pestilential steam and vitiate the air. These facts, taken together, allow a theory to be formed of the effects of alkaline manures. They attract the acids of the soils, and, on combining with them, assume new qualities. Though they may, and do unite with fixed air into carbonates of pot-ash, yet the greater good done by manuring with alkalies, is the conversion of themselves to nitrites, by forming connections with the more strong and active septic acid. Too much of this unneutralized acid does harm even in the richest soils: this alkali, by saturating it, will bring them to a more productive condition. Where land is bare, and exhausted of organic matter, alkaline manures are not very profitable: there is no surplusage of acid to overcome, and, consequently, no new nutritious material produced by the union of the two into nitre.—The general conclusion, from what has been mentioned, is, that, in the street-manure of cities, the door-dirt of country-houses, the stable-dung of animals, &c. there is a portion of septic acid, which exists in close coherence with pot-ash, or in looser connection with some other material. Hence we can explain why *common ashes*, and *the ashes of lime-kilns*, are so serviceable as fertilizers on being mixed in the heap with *street manure*.

The next object of inquiry is, how the nitre of the soil operates? This question resolves itself into parts: 1st. The operation of nitre upon the soil itself, or the substances put on it for manure; and 2dly. Its effects upon the constitution and economy of plants.

1. Notwithstanding the firm alliance of septic acid and pot-ash, there is one substance by which it may be broken. This is the acid of sulphur, or vitriolic acid, which sometimes occurs naturally in the soil, but in modern husbandry is more frequently introduced in combination with lime, and spread upon the land in the form of gypsum. Nitre, it has been said, is composed of septic acid and pot-ash; gypsum consists of sulphuric acid and lime. If nitre and gypsum meet, then there will be a decomposition of both; the sulphuric acid of the gypsum will quit the lime, to form, with the pot-ash of the nitre, a vitriolated tartar; and the septic acid of the salt-petre will unite with the lime of the gypsum, into calcarious nitre, by the application of plaister of Paris. In such circumstances, the principal change wrought is the conversion of the septite of pot-ash, into a septite of lime; the septic acid in the latter case being more easy of separation and decomposition than in the former, and, of course, more favourable to the growth of plants. But of this, mention will be more particularly made under the 13th article below. The vitriolated tartar, or sulphite of pot-ash, has not any fertilizing effect that I know of. Sea-salt is almost always mixed with manures, in greater or less quantity; but as it is composed of the muriatic acid and soda, and as neither of these ingredients can decompose salt-petre, the two compound salts can exist in each other's neighbourhood, without undergoing decomposition on either side. 2dly. Besides the power already explained, by which plants are rendered capable of decompounding the septic acid when applied to them in a dilute form with water, they seem to possess a further power of separating this acid from its alkaline basis. There has been considerable diversity of opinions, as to the mode in which nitre operated as a manure. The facts appear to me reducible to the following heads. 1. The nitre may be wholly absorbed by certain plants, as perhaps in tobacco, without undergoing decomposition. 2. It may be decompounded, and the pot-ash chiefly be absorbed, as in wormwood. 3. After decomposition, the acid itself may perhaps be inhaled, and impart corroding qualities to the juices of plants, as in Euphorbium, Celandine, &c. 4. The septic acid may be resolved into its constituent parts, and the septon be retained in large proportion, as in cabbages; or, 5. The septon may be expelled in the form of azotic gas, and the oxygene remain as in sorrel, currants, &c. In so many ways may the septite of pot-ash operate, and impart the whole, or some part only of its ingredients, to the plants on which it acts, according to the appetite and disposition of each, determining them to retain one part or another, jointly or separately, as best suits their living economy in each particular case. Thus, the ancient opinion of nitre, as a fertilizing material in manure, is confirmed by modern experience and theory.

11. Septic acid may exist where there is no pot-ash; or there may be more acid than the pot-ash existing in the dung-heap or soil can neutralize. In such cases, the common salt, or muriate of soda, which is consumed in large quantities, by men and brute animals, and which is mingled more or less with beds of manure, may undergo decomposition. It was stated in the preceding article, that the pot-ash of the nitre restrained its acid, from making any coalition with the soda of the sea-salt. But the case will be different when no pot-ash is present, for then the alkaline basis of the common salt having a stronger attraction for the septic than for the muriatic acid, will dissolve its union with the latter, and form a more firm connection with the former. Under such circumstances, then, sea-salt will be changed to a septite of soda, (cubic nitre) and the muriatic acid will be set loose. And, in like circumstances, the same neutral salt will be formed from solutions of soap made of kelp or barilla. This same principle will be found to have an extensive application to all maritime situations, where the land is always in some degree impregnated with particles of sea-salt, elevated by the surf and winds, and borne to some distance through the air, or brought upon the land with the fodder cut upon salt marshes. The septite of soda is more easy of decomposition than salt-petre, and might, therefore, seem to be a preferable manure; to some plants it may be so, particularly to such as, by their incineration, afford that species of fixed alkali; but as this is not the case with the greater part of upland vegetables, the soda will be of little or no service, as it is not an article of their food; perhaps it is frequently of disservice. If gypsum, strewed upon land, meets with cubic nitre, it ought to be decompounded; the sulphuric acid of the gypsum uniting with the soda of the other compound salt, into a sulphite of soda, (Glauber's salt) and the septic acid combining with the earth of the plaister into a septite of lime (calcarious nitre). As to the action of the living economy of plants upon cubic nitre, it is the same, mutatis mutandis, with that already given in the preceding article, on the manner in which prismatic nitre or common salt-petre is affected.

12. The discussion of this article will involve a good deal of the theory of lime as a fertilizing substance in farming. From the greater abundance of lime, or calcarious earth, in and about human dwellings, and on farms, than of pot-ash, soda, and ammoniac, it might be presumed, a priori, that the septite of lime would be a very common production. This is the fact. Wherever, in the absence of the two alkalies, septic acid or its fumes meet with lime, calcarious nitre is formed. Lime is commonly exposed to putrid materials or their exhalations, in three forms; 1. That of quick or caustic lime. 2. Of mild or carbonated lime, or lime united with fixed air. And, 3. The sulphite of lime, gypsum, or plaister of Paris.

1. The common form in which lime-stone is found in the large strata of the earth, is that of combination with the acid of charcoal or fixed air. The lime is obtained from this in its distinct and caustic state, by exposure to a high degree of heat, whereby the carbonic acid is driven off in the state of gas. It is then called quick-lime, and, in that condition, is brought to market, and employed in husbandry and the arts. After having been deprived of its fixed air, the lime is always greedy of regaining it. This process goes on so certainly, that quick-lime, by being exposed to the open air, will grow mild again, by absorption of carbonic acid. From the avidity with which these two bodies associated, in ordinary circumstances, it has been imagined that quick-lime acted upon land or manures by promoting putrefaction; that is, by disorganizing animal and vegetable substances, and depriving them of their fixed air: this may be true in certain circumstances. A more common operation of the calcarious earth, is to neutralize the septic acid of the soil or dung-hill, temper its stimulant and corroding nature, and, in a junction of two caustic bodies, form that mild compound the septite of lime. If the carbonate of lime be thrown into a heap of manure, the fixed air will be expelled, and the septic acid take its place. Thus calcarious nitre is formed when quick-lime is employed as a manure upon land impregnated with putrefying matter.—Provided there is more lime than the septic acid can saturate, the surplusage may re-attract carbonic acid, if no stronger one prevents.

2. If mild lime be added instead of quick-lime, the septic acid will, as in the former case, constitute with it calcarious nitre; but will, in addition to this, cause an extrication of fixed air, which appears to act, when applied in a moderate quantity, both as a stimulant and nutritive ingredient of plants. But I must not digress by entering into a discussion of the effects of charcoal, its oxyd and acid, upon the vegetable economy.

3. The prodigious effects wrought by the sulphite of lime, or plaister of Paris, in many places, are matters of great profit as well as surprise to farmers. Specimens of a very pure gypsum have been brought to me from one of the western counties of the state of New-York. This must, in course of time, become of invaluable importance to that interior country, as well for architecture as for agriculture. The manner of its production seems to be this. Great quantities of sulphur are found thereabout. This frequently combines with clay and iron, into martial pyrites. Many varieties of this pyrites are prone to attract oxygene from the atmosphere, and when this happened, the sulphur was converted to vitriolic (sulphuric) acid, a part of which dissolved the iron, and formed green vitriol or copperas, (sulphite of iron); and the rest combined with the clay into alhum (sulphite of clay.) When these processes

went on in the vicinity of great beds of lime-stone (carbonate of lime.) the calcarious earth gradually attracted the sulphuric acid from the iron and the clay, and in the course of ages, the strata of common lime-stone were converted into the sulphite of lime (gypsum.) The disengaged fixed air then flew away, while the iron and clay turned to ochre. Phenomena analogous to these have probably, in some former æras of the world, accompanied the formation of other masses of plaister of Paris. How, now, does such a sulphite of lime operate when employed as a manure? Its operation will be modified by the circumstances which accompany its application and modify its power. Gypsum may be decompounded several ways. 1. By the nitrite of pot-ash (salt-petre.) 2. By the nitrite of soda. And, 3. By the muriate of soda. 4. By the carbonate of pot-ash (mild vegetable alkali.) And, 5. The carbonate of soda (mild mineral alkali.) In any of these cases, one or other of which is likely to occur when gypsum is employed to promote vegetation, it will be generally decompounded. And upon this decomposition, it is not unlikely much of its value depends, in some cases of its application; and to the same cause may its want of success be ascribed, in others.

1. If the investigation, herein attempted, has any validity in it, the septite of pot-ash is a frequent production in manure. Gypsum, mingled with such manure, may be expected to undergo decomposition, by a double elective attraction: The pot-ash of the nitre attracting, by a stronger affinity, the sulphuric acid of the plaister of Paris, and forming a sulphite of pot-ash (vitriolated tartar.) and the disengaged septic acid joining the lime, and constituting a septite of lime (calcarious nitre.) This latter substance seems, in this case, to be the fertilizing ingredient. 2. If gypsum is sprinkled on a soil abounding with the septite of soda (cubic nitre,) it ought to be decompounded; and while the sulphuric acid joins the alkali, and forms a sulphite of soda, (Glauber's salt,) the septic acid constitutes, with the calcarious earth, a septite of lime. In this case too, calcarious nitre seems to be the active ingredient of the manure. 3. When the plaister is applied to a soil impregnated with common salt (muriate of soda,) a double decomposition may happen; the sulphuric acid forming with soda a Glauber's salt, and the muriatic acid making with the lime a muriate of lime. As neither of these substances is remarkable for promoting the growth of vegetables, the reason is plain, wherefore gypsum so often fails to fertilize land, in the neighbourhood of the ocean, or in any place where it can be decompounded by particles of sea-salt. But even on some farms in the state of New-York, bordering upon the salt water, gypsum will sometimes produce considerable effects; and these will depend, in some degree, upon the force and direction of the winds, bringing more or less

of the saline spray of the Atlantic along with them, and on the employment of salt-fodder on the farms. 4 and 5. Whenever the carbonates of pot-ash and soda are applied to gypsum, its sulphuric acid may combine with them into vitriolated tartar and Glauber's salt, then while part of their carbonic acid converts the basis of the plaister into a carbonate of lime, (mild calcarious earth,) the rest may mingle with water and other surrounding bodies, and contribute in those forms to nourish vegetables.

These rules, here investigated, will strictly apply to pure gypsum only. Under that name, a considerable variety of the sulphites of lime are brought to market and sold. Those varieties, I believe, are not merely such as result from the fibrous, lamellated, or amorphous structure of the gypseous material. They differ from each other further. 1. In the degree of purity: and, 2. In the force of chemical attraction, binding the ingredients together. In respect to the latter particular, there is something not wholly understood in the composition of gypsum; for though it can be tolerably well analyzed, there is a somewhat in the texture of some sorts of it, that cannot be perfectly arrived at or imitated by synthesis. The very considerable variety in the purity and cohesiveness of plaister of Paris is, no doubt, another cause of uncertainty in its operation, and of perplexity in theorizing upon it. And to this jointly, with the substances enumerated before, as capable of decomposing it, may be ascribed much of that irregularity approaching, as some term it, to something like whim or caprice, for which this manure is so remarkable. Septic and carbonic acids cannot decompound gypsum. If there is no alkali in the soil, I see not how it can be decompounded at all in manure. Perhaps it can answer a valuable purpose without decomposition. It may be so, though I question it very much. The formation of calcarious nitre seems to be the thing which characterizes the decomposition of gypsum, in cases where particularly the most benefit has been derived from it; and this corresponds with the great fertility imparted to land, by the same thing, in old walls, rubbish, &c.

13. If there be neither pot-ash, nor soda, nor lime, to lessen the vehemence and repress the activity of the septic acid and its vapours, the volatile alkali is the substance having the next degree of attractive force for them. The general opinion of philosophers, that ammoniac was the common and almost universal result of the putrefactive process, I believe to be a misconception. If it is such a common product of corruption as it has been alledged to be, it is very strange it should be so difficult of detection. No one will deny that it *may* be formed during the decay of organized matter; but this seems to be rather an unfrequent occurrence. Whenever volatile alkali meets with septic acid in the earth, which

I believe to be a very rare event, there will be a formation of nitrous ammoniac. The virtues of this as a manure have not been investigated that I know, further than respects the operation of *soot*, which contains it; and on this point more precise information is wanted than I am possessed of. From its easy decomposition the septite of ammoniac would seem to be a very operative ingredient in manure.

14. Septic acid has an attraction for clay. This, however, is so weak, that the presence of any of the substances already enumerated will prevent the connection, or dissolve it if made. In soils, therefore, where neither pot-ash, soda, lime nor ammoniac exists, nitrous allum may be formed, and contribute something to the productiveness of land.

15. The union of the acid of putrefaction with oily substances includes both the case of the rejected water of wash-houses, and the corruption of organized bodies. The greasy part of soap, the adipose matter of carcases, the oily substance of certain seeds, &c. are all capable of being changed into new forms by the operation of septic acid. By this they seem to be modified in such a way as to afford healthy aliment to many sorts of vegetables.

Such are the methods by which this active and abundant product of corruption is overcome and kept within tolerable compass. Some substances only neutralize it; others again rend it asunder, and dissever element from element. But the processes I have exhibited, though they are the principal which agriculture furnishes, are not the whole which nature has provided for the destruction of septic acid; for it acts with more eagerness upon other bodies, and on a greater variety of them than other acids, chiefly on account of its being of more easy decomposition. The dissolution of silver, the explosion of gun-powder, the deflagration of nitre, are all of them processes of a similar kind. As the quantity produced is prodigious, so the means of destroying it are adequate, and, upon the whole, well adjusted.

On this occasion, I wish to avoid the censure of ascribing too much to one principle or thing. I would not be understood as giving an entire theory of manures: all that is intended is to bring to view, and to interpret the history of septon, and its compounds, in some of their relations to physic and farming. Nor would I incur the charge of saying these things are the only pabula plantarum. Partial views in abundance are already before the public, in favour of attenuated earth, water, hydrogene, carbone, &c. I believe all these have their effect. But, as they have each been treated of more particularly than the septic substances have, I merely undertook the statement of the subject, as far as these latter were concerned, in such a manner as appeared to me to be just.

The acid properties of some manures, and the alkaline or absorbent nature of others, highly deserve the consideration of agriculturists. Without an attention to the action of the former of these upon the latter, the formation of manures, and their operation upon plants, cannot be understood. These might easily be reduced to a small table, and their affinities traced.

Acids commonly present in manures.	*Alkalies very frequent in manures.*
Septic, or nitric acid.	*Pot-ash*, or *vegetable* fixed alkali, very common.
Carbonic acid, or fixed air, both very common.	*Soda*, or mineral alkali.
Sulphuric acid, sometimes.	*Ammoniac*, or volatile alkali, now and then.
Muriatic acid, very frequent in the neighbourhood of the ocean, and abounding on farms where much salt fodder is consumed.	*Lime*, or calcarious earth, very common indeed.
Phosphoric acid, not unfrequently evolved during animal decomposition.	*Magnesia*, sometimes.
	Clay, almost always.

But to return to the subject of sickly air. As the vapour issuing from *putrid* substances is occasionally of an acid nature, the alkalies will, under all possible circumstances, unite with it, and neutralize it. This is a *composition of septon with oxygene*, which, according to abundance of experiments, form the effluvium of high animal putrefaction. This vapour has been called *putrid*, and supposed to act as a *ferment* in corrupting the fluids, &c. of the living body. Such an opinion, besides being a violation of all sound reasoning, is entirely contradicted and refuted by the experiments made long ago by ALEXANDER in Scotland, and now lately by BRUGNATELLI in Italy: whence it is proved, that both *water* and *air*, tainted with *putrid effluvia*, not only do not promote putrefaction like *atmospherical air* and *common water*, but acquire therefrom a power of *retarding and resisting the corruption of dead animal substances, in an eminent degree.* In such atmospheres, so little favourable to the putrefaction of substances, do pestilential, malignant, endemic and epidemic disorders prevail. But the unwholesome exhalations do not act by promoting directly a *putrefactive fermentation* in the body, but by *morbid* or *excessive* stimulation, causing inordinate or violent excitement, and thus inducing disease and death.

In these modes does it appear, that the volatility of acid exhalations is repressed, and their causticity blunted by the more

fixed and strongly neutralizing qualities of the alkalies; that, in proportion to the nature of the compounds formed by the union of these with each other, or with yet other substances, will the products be various, and impregnate the soil accordingly; and from the composition and character of these, will the land, in a good degree, derive its productiveness or sterility, and the climate no inconsiderable share of its salubrity or unwholesomeness.

New-York, July 1, 1797.

ARTICLE III.

[Recommended to all who have read the Treatises on Epidemical Diseases written by Doctor SYDENHAM.]

Doctor MORTON's *Summary of the History of the continued Fever in England, from* 1658 *to* 1691; *being the Appendix to the second Exercise of his* Πυρετολογια, *p.* 415 *&* *seq.*—Translated from the original Latin for the Medical Repository.

I SHALL begin from the year 1658, an æra I well remember, when this fever, both in its spurious and simple form, prevailed throughout all England, particularly in the autumnal months; as our celebrated Willis has testified in his treatise of fever, formerly published. Oliver Cromwell, who at that time was protector of England, and my revered father, a very experienced physician, both died that year, of this fever, about the beginning of September, when it arrived to its height: the synocha, in both cases, as the powers of nature gave out, turning to synochus, with delirium, spasms, and other symptoms of high malignity. And even then, after I had beheld my mother, brothers and sisters, the men-servants, the maid-servants, the nurses, and every body within the house, and almost every person in the same and the neighbouring parishes, infected and laying sick with this poison, I remember well, and I have reason to remember it, that I myself was taken ill of the same distemper, and after a narrow escape from death, on the first attack, I was three months slowly recovering: the *continued fever*, with which I was first affected, turning into a *quotidian*, and then into a *tertian intermittent*, after the poison had been subdued by a long-continued and repeated expansion of the spirits. At this time, almost the whole of this island (Great-Britain,) especially in the autumnal months, resembled an hospital; and, in some places, such was the amount of sickness, that there was not well persons enough to take care of the sick. It is, however, very certain, that this fever, though so extensively epidemic, was less fatal than the pestilential or malignant fever commonly is, because it arose from a milder poison. Whence it came to pass, either by the expansive power of the spirits, or the assistance, such as it was, afforded by art, (for as yet the efficacy of the bark, in overcoming the power of this poison, had never been proved among us, at least,) a great many recovered from the distemper, though slowly. But you might see, almost every where, persons, after the sixth or seventh exacerbation,

(where nature had been forced, at last, to yield to the increased violence of the poison,) having no more fits and remissions, nor any trace of them, seized with malignant continual fever, accompanied with horrid spasms and delirium, carried off in the seventeenth or twentieth day of the disease. Others were, as it were, prematurely cut off, by a *diarrhœa* and *vomiting*, or pains like those of *pleurisy*, *peripneumony* or *colic*; or, worn down and exhausted by some more violent symptom of the *spurious synocha*, died on the seventh, ninth, or eleventh day of the distemper. Besides, of those who escaped from the diseases, almost all that I knew of, passed the winter in the sickly way; for even during the coldest weather, quartan, tertian, and quotidian intermittents, arising from a more moderate quantity of the same poison, were almost as epidemic as continued and remittent fevers had been in the fall. Nor, indeed, during the prevalence of the frost, did these synochas entirely leave us, but though they were not epidemic, as the preceding autumn, they every where appeared sporadically, during the next spring and summer, until the month of August. From this time, and the whole course of the autumnal months, they on all sides increased, and became epidemic again. And thus I observed this fever to be very general under the forms of a simple and proper synocha, and under a quotidian and tertian type, and during the fall, to be more or less epidemic, until the year 1664; during which period, it was fatal to a great many, notwithstanding the dogmatic and exquisite method of treatment which then prevailed; the efficacy of this Peruvian antidote, in destroying this poisonous ferment, being yet unknown to the common herd of prescribers.

At the beginning of the autumn of the year 1664, this fever had nearly disappeared; and almost all acute diseases had suddenly vanished; and the constitution of the season became very wholesome. But on the return of spring, after an uncommonly severe winter, and a comet in the Heavens, the fore-runner, as it were, of this calamity, the poison gathering fresh strength, and increasing prodigiously, unexpectedly changed this synocha to a most dreadful and destructive plague, which, spreading epidemically, killed, in the duration of one year, more than forty thousand persons. Yet, during the rage of this plague, vestiges of the synocha were not wanting; for as many as escaped from the plague, either by the efforts of nature or the aid of art, and began to exhibit buboes, parotides and carbuncles, or other monuments and trophies of victory over the enemy, experienced in themselves, as if by a milder operation of the poison, or greater vigour of spirits, every day, or every other day, exacerbations and remissions of these symptoms, alternating with each other, at stated hours. Whence, I think the medical faculty of Naples are not justly chargeable with rashness, (as Badi relates, Anastas. lib. i. chap. 20,) in hav-

ing ordered the Peruvian bark to be prescribed in the cure of plague; and it may contribute a great deal to destroy this poison, (when of a milder sort) and afterwards hasten the cure.

Moreover, this dismal plague, disappearing about the beginning of the year 1666, the synocha fever, occasioned by a milder poison, began to shew itself, attended with painful and dysenteric flux. From the beginning of August, it spread and grew worse and worse, through all the autumnal months. I was infected by it myself, as I caught the distemper from incautiously examining a dysenteric stool, and, with difficulty, recovered from it: and so violently and epidemically did this malady prevail in London, that the next fall I had another attack of the disorder, induced by a similar accident. But, during its height, in the months of September and October, at which times the simple synocha ordinarily prevailed, there was scarcely any other disorder to be seen. Almost the whole city was down with it, and every week, from 300 to 400 and 500, were carried off by fluxes and gripes, and the other dreadful symptoms of excruciating dysentery, or colliquative diarrhœa, on or about the 14th, 17th, or 20th days of their illness, accompanied with unquenchable thirst, white or black aphthæ, quick pulse, delirium, and other tokens of the epidemic fever. Many, however, after the looseness and griping, and other symptoms of dysentery had been suppressed, by the plentiful use of opiates and astringents, nevertheless languished and lingered along, until emaciated and burned up almost, they fell into a fatal hectic. I remember others who were preserved (the virulence being critically expelled by the salivary ducts) by the appearance of aphthæ, and profuse salivation, (which frequently comes on at the crisis of the synocha.) Then, again, the poison, taking on itself the form of an epidemic dysentery, spontaneously attacked the intestines with the violence of colocynth, or any other cathartic; excited in them perpetually horrid and vellicating spasms, and causing a copious effusion of colliquated and poisonous serum through their glandular membrane, induced a considerable exhaustion of strength, but not so great but that nature, after stated or uncertain periods, especially in the beginning of the disease, would recruit a little, collect force, make a stand, and sometimes gain a victory. This was very easy to be observed; for a remission and exacerbation of the gripings, looseness, and other tormenting symptoms, were plainly observed to return duly on every other day. During the remission, all the excruciating symptoms were sometimes spontaneously mitigated; but, on the return of the fit, they were not to be restrained by the powers of opiates themselves. Whence I clearly discerned, that the dysentery was but a symptom, and that the fever, (howsoever it might, by reason of the suppression of external heat, by the griping and looseness, conceal itself from the observer,)

even of the true synocha type, was the primary disease, and arose from a more mild poison, operating in this instance like a cathartic. And, at last, relying firmly upon this observation, I undertook a new method of treatment. Before this, I had been engaged with the rest of the medical practisers, in vain attempts to overcome the disease, by rhubarb, myrobalans, opiates, and astringents externally exhibited, as well as by anodyne clysters, fomentations, and other things of high name, and warmly recommended by authors for the cure of dysentery; while, during all my efforts to allay their wretched symptoms, the poisonous ferment was lurking within the body. In addition to opiates and astringents, which merely regard the dysenteric symptoms, I determined to employ some more powerful febrifuge, (if I could find such an one) which, by destroying the poisonous ferment of the fever, and the cause of the looseness, would, at once, be capable of removing the fever, stopping the flux, and, of course, allaying the gripings. And my mind was the more inclined to this opinion, because I had often observed the miserable patients, notwithstanding the most antidysenteric remedies, exhausted with these most severe symptoms, until at last they died upon the close-stool; while others, driven, by many astringents and opiates, to delirium and fainting, and made drunk rather than well by them, frequently suffered an unexpected return of the dysenteric symptoms; and becoming emaciated, with a quick pulse, hectic heat, and other tokens of a poisonous taint lurking in the constitution, at last expired in a state of quietness and costiveness of the bowels. Judging from the alternating exacerbation and remission of the griping and flux, (which I had long ago often known in some form or other to accompany this disease, at least in its beginning,) rather than from the feverish heat, which, in proportion to the troublesome symptoms, I found to be, in some degree, unequal, but always low and moderate; in such cases, I determined to try the powers of the Peruvian bark, mixed with laudanum. Nor was this rashly done, since, however prone the bark may be to purge, by irritating the tender intestines by its bitterness; yet, when mixed and obtunded by laudanum, which stops the running off of the juices, and blunts and stupifies the exquisite feelings of the guts, it may be reckoned a proper remedy to all, and compose the flux and griping, as well as the fever, by subduing the colliquative poisonous ferment. I first experienced the efficacy of this most celebrated febrifuge in dysentery, in a patient living in *Long-lane*, who laboured under a *tertian* dysentery; for some cases of this sort occurred to me in practice, where gripings and a slimy bloody flux returned every third day, at a stated hour, notwithstanding the most diligent exhibition of *opiates;* while, in the intervals, these cruel symptoms were mitigated by administering a small dose of laudanum, or oftentimes of their

own accord. Seizing, therefore, the first opportunities of a remission of the symptoms, I ordered, without delay, a drachm of bark with a grain of London laudanum, to be taken in the form of a draught, and repeated every fourth hour, until six doses had been administered. What was the consequence? So far was the bark from irritating the intestines by its bitterness, that I immediately perceived they were more effectually composed and appeased by laudanum mixed with the bark, than joined to astringents; for, from the exhibition of the fifth or sixth draught, the flux and griping, together with the fever and other accompanying symptoms, entirely went off, and never returned at the accustomed periods. This observation encouraged me to try the powers of this sovereign remedy in *quotidian* dysenteries, as often, and as long as they took upon themselves the synocha type, though, with some irregularity, in the exarcerbation and remission of symptoms, and they were not of the *malignant* kind. Nor did the event disappoint my expectation: and I have no doubt, that every epidemic flux, and every looseness, connected with fever, even *camp fevers*, accompanied, as they generally are, with similar symptoms, to wit, the spurious synochas, might be much more certainly cured in this short way, than by the formidable apparatus of *rhubarb*, *myrobalans*, *astringents*, and *opiates*, which have hitherto made up the treatment of these kinds of diseases. But of these things I shall speak more at large, in my fifth Essay on *colliquative* fevers. At present I only mention them, that I may shew, that the *dysentery* and *griping diarrhœa*, which lasted near seven years, and renewing its violence here in London, raged epidemically almost over the whole country, from the year 1666, to 1672, arose from a true synocha, which I denominate a spurious synocha, because it was connected with a more violent colliquation of the juices, and their excretion by the intestines. And, indeed, it was a favourite wish of mine, that from the true and genuine idea of this disease thus formed, more certain indications of cure should be thenceforward derived; so that the *camp flux* and *dysentery*, or any other epidemic, should be designated by the proper name of *spurious and colliquative synocha*.

As the genuine synocha, from the year 1665, (when, from the working up of the poison to its height, the plague broke out,) disappeared for almost two years, and did not return, as before, with the return of warm weather; in like manner, this *spurious and colliquative synocha*, called by the name of the *griping dysentery and flux*, which succeeded the plague, and returning every autumn, continued to exercise its virulence, far and near, in these parts, did at last entirely cease. But it was succeeded by the epidemic measles, which, like a milder plague, sparing neither age nor sex, prevailed

with such mortality in London, in the fall of 1672, that there died about three hundred a week of it. But these never afterwards existed with so great a degree of virulence. In what degree however, this same *pestilential* and *epidemic morbillous fever*, after arriving to its height (that is, where the event was to be fortunate,) resembled the synocha form of fever, and how excellently the Peruvian bark succeeded in the cure of it, will be afterwards related in its proper place; to wit, in the second chapter of my third essay, where I shall professedly treat of the measles and scarlet fever.

Toward the close of winter, this morbillous constitution began to decline, after a duration of six months, and at length entirely ceased, leaving the febrile poison, in 1673, considerably more mild and moderate, as it still continues to be. Whence it happens, that the fever which hitherto raged annually from the month of August to the winter solstice, no longer put on the appearance of griping diarrhœa or dysentery, nor was accompanied with any other more violent symptom; but for twenty years wore the same appearance as it did before the breaking out of the plague of 1665 and 1666: and it is not improbable it will continue to observe that type, until, by some fatal plague, the poisonous ferment shall be changed, and exalted to a more deleterious degree of virulence. I confess indeed, that in some years, from a milder degree of the poison, particularly from 1677 to 1682, that quotidian intermittents, tertians and quartans, were nearly as epidemic as the synochas; and that, in later years, particularly during the height of the constitution, in the months of September and October, the very synochas, from a more irritating degree of the poison than usual, were sometimes attended with some more violent symptom, which did not only take on *the form of a periodical flux* and *dysentery*, but also of *cholera morbus*, *excessive vomiting*, *flying rheumatism*, *pleurisy*, *colic pains of the stomach and intestines*, or of some other very acute disease; and that these synochas, when not seasonably and properly treated, often, from an increase of the poison, degenerated into *malignant* and fatal fevers; and even sometimes, by reason of an unusually deleterious degree of the poison, indicated *malignancy* from the beginning, being of the *purple* or petechial kind, and distinguished by a morbillous eruption, watery blisters scattered over the neck and breast, parotides, buboes, carbuncles, and other malignant symptoms. But all these fevers, whether spurious, synochas, or malignant, were also *sporadic*, and did not spread by contagion, as in the pestilential constitution. The only epidemic fever which I have observed regularly to return every fall, for twenty years past, was the *simple synocha*, which always yielded to the bark when seasonably administered. Nor did the epidemic constitution or influence of small-pox, erysipelas, scarlet fever, rheumatism, sore-throat, pleurisy,

or any other, which prevailed at any season of the year, make so considerable a change in the autumnal poison, that the epidemic fever proceeding from it, changed at all its usual type in such a course of years, or went through its stages after a new and varied manner.

IT is matter of equal curiosity and instruction to observe the varied shapes and degrees, under which Doctor MORTON has so acutely detected the operation of a single noxious principle. Equal sagacity and diligence of observation would often certainly lead to the same result. The history of diseases in our own country, for some years past, furnishes so many circumstances of a correspondent aspect, that no person can avoid being struck with the resemblance.

By this attention to the extensive operation of a single morbid power, we not only enlarge our acquaintance with the nature, origin, and causes of diseases, but receive important lessons concerning the prevention and treatment of them. Instead of wandering to foreign countries to trace the source of contagion, or multiplying morbid causes without end, we discover the materials of mischief growing up and acquiring malignity under our own eyes; and we learn to acquiesce in the simplicity of nature, and only to distinguish when she has established a real difference.

It is probable, if medical history were sufficiently ample and authentic to enable us to compare the phenomena of diseases, as they have existed in all ages and countries, we should find much more ground for the same inferences, which arise from this remarkable chapter of Doctor MORTON's work.

ARTICLE IV.

REMARKS ON THE CHOLERA, OR BILIOUS DIARRHŒA OF INFANTS.

By EDWARD MILLER, *M. D.*

THE Cholera of infants forms one branch of a large stock of diseases, as much distinguished for the universality of their appearance, as for the diversified character they occasionally assume. Another form of them, more familiarly recognized by the public, is that of remittent and intermittent fevers. On account of circumstances, which every body is acquainted with, they have attracted, for several years past, much more attention than usual. Views of the subject, more comprehensive and accurate, have enlarged the number of them, by bringing back to their proper station many diseases, formerly so much disguised in external appearances, as to conceal the fact of their radical relation. And it will not be surprising, if this simplification should be carried much farther; nor if our successors should groupe together a still larger assemblage of diseases, and demonstrate their origin from one common cause.

Notices of the cholera of infants are to be found in almost all the writers, who record the annual epidemics of summer and autumn, in sickly countries. Cleghorn, in his account of the diseases of Minorca, describes it exactly as it appears in the United States, invading children some weeks sooner in the season than similar affections are discovered in adults; which he properly ascribes to their greater excitability, and to the remarkable tenderness of the alimentary canal in the infantile system.

The importance of the subject now undertaken, is admitted by every physician. For, notwithstanding the nature of the disease is, at present, well understood, and the treatment greatly improved, it still continues, particularly in the southern and middle states, to destroy multitudes of infants, and even, in more favourable cases, to prove, in a high degree, obstinate and distressing.

An interesting account of the cholera of infants, by Dr. Rush, has been many years before the public.* His description of it is so accurate, that, after much attention to the disease, I am unable to add any thing which, in that respect, deserves to be considered important. His account of the nature and causes of this complaint,

* Medical Inquiries and Observations, vol. i. p. 112.

of the relation it bears to some others, and of the mistakes that have prevailed on this point, is so just, that it has been commonly adopted. The mode of treatment he recommends is very judicious, and has been generally received. But, as this valuable book is in the hands of almost all our medical practitioners, it would be an abuse of their time to repeat these things here. I shall not, therefore, attempt to give any history of the disease, nor propose any general plan of treatment, or any minute detail of remedies. My observations will be confined to a few detached points, which have appeared to me to be important; and they will be often so irregular, and desultory, that this paper can be considered, at most, only as a brief supplement to former essays on the same subject.

The physicians of the United States seem generally to concur in opinion, that a retreat from an unhealthy situation, and particularly a change from the air of cities to some salutary part of the adjacent country, is one of the best means both to prevent and cure this disease. The evidence in favour of this opinion is such, that we shall take it for granted, and only propose the application of the treatment we have in view, in cases where the change of air cannot be obtained.

It is well known, that the situations and circumstances of a large proportion of the community are such, as necessarily to fix them in the spot where they happen to reside. In this case, the best exertions must be made that the nature of the affair will admit.

As the first indication that presents itself, in the treatment of this disease, is to discharge the stomach and intestines of their acrid and offensive contents, great difficulty often occurs in the outset, as to the choice of the means to effect this purpose. When the stomach is excited into action so inverted, convulsive and violent, the administration of emetics will be often thought hazardous. And if a thorough evacuation of the offending matter shall appear to have been already accomplished by spontaneous vomiting, or if the disease shall have invaded with great violence, and already have produced great prostration of strength, feebleness of pulse, and a receding of heat from the extremities, an emetic would certainly be improper and unsafe. The violent action of the stomach should always be suffered to subside before such a remedy as this can be attempted with propriety.

But however mischievous the rash interposition of this remedy may often prove, the maxim that vomiting should never be employed to relieve vomiting, has been sometimes maintained in a sense far too general and unqualified. Mild emetics, which soon cease to operate, will often leave the stomach stronger than before. This is attributed, by Dr. Darwin, to the accumulation of excitability during the stomach's inverted action.* It may also, per-

* Zoonomia, vol. ii. p. 57.

haps, be in part ascribed to the difference in the modes of action, which take place in spontaneous and in artificial vomiting.

To relieve, however, any doubt on this subject, whenever the state of the stomach and intestines is found to require evacuation, a more safe and unequivocal means of effecting the purpose, it is conceived, may be found in the use of calomel, accommodated in its dose to the age of the patient, and to other circumstances. And as long as mere evacuation can be requisite or admissible, this medicine, uncombined, will prove efficacious, gentle and safe. As soon as the profuseness or sufficiency of the discharges, or symptoms of debility, admonish to support the strength, the addition of opium to the calomel, in suitable quantity to compose the stomach and bowels, forms, in my judgment, one of the most powerful remedies ever employed in this disease.

To recommend the trial of mercury, alone or combined with opium, as different states and exigencies of this disorder may require, is one of the principal objects of this paper. A case of infantile cholera, very violent and protracted, attended with dysenteric symptoms, first induced me to make trial of this remedy, according to Dr. Clark's plan of treating chronic dysentery.* It succeeded so completely, that I soon extended the use of it to the bilious diarrhœa of children; and here it answered as happily as before. Some of my medical friends have since made trial of it, and, they assure me, with singular advantage. If with others the same benefit should result, it will certainly not be thought unworthy of being recommended to the public; and, if future experience should find me too sanguine in my estimation of this medicine, this brief paper will, at most, add but little to the mass of hasty and injudicious encomiums bestowed on favourite remedies.

As to the dose of this medicine, or the interval of repetition, it is difficult to speak with precision, considering the variety of circumstances which must always determine questions of that sort. It will, perhaps, convey an idea, sufficiently explicit, of the mode of exhibiting this remedy, to observe, that from an eighth part of a grain to one grain of calomel, combined with a portion of opium, from a twentieth part of a grain to half a grain, repeated every 2d, 4th, 6th, or 8th hour, will comprize nearly all the range of variety necessary in the treatment of this disease, in order to accommodate the medicine to all the circumstances of age, constitution, and habits, as well as the endless differences in the state and degree of the complaint, in the concourse and succession of symptoms, &c.†

* Diseases of Hot Climates.

† To be more particular—a child about two years old may take a pill composed of one-sixth part of a grain of opium, and one-third part of a grain of calomel, every 2d, 4th, or 6th hour, or sometimes oftener, according to the

It will scarcely be necessary here to observe, that not only the relative quantities of these ingredients require to be continually varied in order to meet the ever-varying circumstances abovementioned, but that frequently one or the other article should be entirely omitted, accordingly as evacuation or astriction of the alimentary canal, or greater or less degrees of either, may be held in view.

The form of pill was commonly preferred, in prescribing this medicine. If the child was too young to swallow an entire pill, it was directed to be broken into small fragments, and given in any pleasant vehicle, liquid enough to be readily taken without adhering to the mouth, and of sufficient consistence to entangle the small pieces of the pill. When it was necessary to depart from this mode, the addition of a little white sugar, and of a small portion of some aromatic, easily formed powders of a convenient size.

The following advantages seem to attend the use of this medicine.

1. The facility of exhibition. Neither article, when properly enveloped, is nauseating—the smallness of the bulk, and the agreeable form into which it may be reduced, remove every difficulty. The trouble of giving unpalatable remedies to children is experienced every day; and the trouble increases with the bulk. Impressions on the senses frequently affect the stomach, especially when enfeebled by disease; hence a disagreeable taste or smell will sometimes so instantaneously produce the rejection of an article attempted to be swallowed.

2. The difficulty of dislodging it from the stomach by the utmost violence of vomiting. The great specific gravity of the calomel seems to favour the retention of the opium, as well as of itself, on the stomach.

3. By this combination, much more of each ingredient, active and powerful as they always are, can be safely and advantageously given, than in a separate state. They evidently correct, regulate, and soften the powers of one another.

4. It is calculated to obviate the most fatal tendencies of the disease. When a fatal termination takes place at any other than a very early period, there is ground to conjecture that effusion in the head, or destruction of the organization of the stomach or bowels, commonly takes place. The symptoms of determination to the head render the former probable; and the inflammatory, dysenteric, and gangrenous appearances leave little doubt of the latter.

urgency of the symptoms. If much evacuation be wished, the above quantity of calomel is too small; if much astriction be desired, and the intestines be very irritable, it will be too large. And so also, vice versa, with respect to the opium.

That mercury is well adapted to prevent consequences such as these, will be readily agreed.

5. Calomel, combined with opium, and especially when exhibited in small doses, excites a strong absorbent action, with respect to the fluids poured into the stomach and intestines. Most of the metallic salts possess more or less of the same power. The degree of absorption effected by the combination of calomel and opium will probably be in proportion to the quantity and completeness of the evacuations previously made by the calomel alone, or other evacuant means; as absorptions in general are increased by inanition.

It will be difficult, we conceive, to appreciate the virtues of calomel in the cholera of children, unless we hold in constant view the quantity, vitiation, and acrimony of the contents of the stomach and bowels. When the intestines are so enfeebled and diseased, a diarrhœa may be present for many days, even for weeks; and yet excrementitious matters may collect and remain in such quantity as to produce the greatest mischief by their putridity and excessive stimulation. In what manner shall we venture to expel this matter? Physicians generally agree, that calomel, though commonly safe and gentle in operation, is the most penetrating, detersive, and effectual of all the means employed to cleanse the intestinal canal; that it dislodges substances not to be moved by other purgatives; and often discharges more bilious and other acrid matter of every description at one, than other cathartics at several evacuations. It results then from all this, that in calomel alone, we possess an excellent evacuant in the diseases denominated bilious; and that in calomel, joined to opium, we have a medicine of still higher value.

Cases may, perhaps, occur, of such irritability, in the alimentary canal, that no portion of calomel can be borne, even in connection with opium. Such cases, indeed, we have not yet met with; but supposing them to happen, we should advise, without hesitation, the external application of mercury.

Upon the whole, we think ourselves warranted in ascribing a superior efficacy to the action of mercury and opium, in the cholera of children. The common mode of treatment appears comparatively superficial and palliative; and, of consequence, the effects of it are transient; while mercury, penetrating to the inmost recesses of the disease, and disarming it of all malignity, effectuates a cure, at once radical, durable, and complete. Opiates alone, so generally used, and so much confided in, afford only a short-lived, delusive repose in this tumult of the system.

If it were necessary to fortify, by authorities, the mode of treatment here proposed, it would be sufficient to mention the names of Doctor Cleghorn* and Doctor Clark,† who place a principal reli-

* Diseases of Minorca. † Diseases of Hot Climates.

ance on a combination of calomel and opium, in the worst forms of dysentery. Doctor Lysons* relates a number of cases of the efficacy of a similar composition in the bilious diarrhœa of adults. Doctor Chisholm† depended chiefly on the same medicine, given in such manner as to produce a rapid ptyalism, in the malignant fever of Boullam. Doctor C. Smyth employed the same combination to relieve the formidable symptom of vomiting, and found it successful, when all other means had failed, in the jail distemper.‡ And Doctor Armstrong used, with signal advantage, a composition, substantially the same, in the disease of infants which he denominates the *watery gripes*.§ The efficacy of mercury, also, in the malignant fevers of our own country, within a few years, is, I presume, too well known to need being mentioned in this place.

In the advanced stages of the cholera of children, the virtue of allum deserves much commendation. All acrid and offensive matter should, as much as possible, be removed before the use of it be attempted. It is thought a necessary caution to begin with it in very small doses, as half a grain, conjoined with opium, and gradually to increase them. It possesses the great advantage of small bulk, and of easy envelopement in a pill.

To the preceding observations, we now proceed to subjoin some remarks on the management of the state and temperature of the skin in this disease. It would be difficult to point out any branch of medical attention so much neglected as this has too generally been. The importance of it in all febrile diseases, is unquestionable. In the principles, however, which ought to guide our conduct on this point, we are still sorry to find too much indefiniteness and ambiguity. And although we are persuaded many firm and decisive steps may be taken beyond the common practice at this time, we are not, at present, prepared to state the limits, or deliver the rules which should invariably govern this subject.

As the cholera of children is a febrile disease, and the surface of the body, often heated far beyond the proper point, it will be adviseable to expose all such parts of the skin as feel too warm to the hand, to a stream of cool air, or to bathe them in cool water. Several times a day the patient should be washed with vinegar and water, salt and water, or water alone, by means of a sponge, as he lies in bed, with as little motion, disturbance, or fatigue, as possible. Considerable inequality, as to the heat of different parts of the body, is often observed. If some parts, as the extremities, be too cold, they should be covered with flannel; if other parts, as the

* Practical Essays.
† Essay on Malignant Fever of Boullam.
‡ Description of Jail Distemper, p. 126.
§ Diseases of Children, p. 45.

face, breast, &c. be too warm, they should be cooled by a stream of cold air, or by bathing them, as before directed.*

As to the temperature of the water to be employed for this purpose, there must be much latitude of discretion in different circumstances, as there will be much diversity of opinion in the same circumstances. We believe, it may be safely affirmed, that any temperature of a bath, at, or a few degrees below, the healthy standard of heat, in the human body, will produce a speedy and considerable abatement of febrile heat on the skin. And we have direct conclusive experiments to prove, that such a bath, from 95 to 85 degrees of Fahrenheit's thermometer, when duly applied to the skin, morbidly hot, will powerfully diminish the celerity of the pulse, and the heat of the body. But, wherever these tepid or cool degrees of the bath do not sufficiently carry off the heat, the use of colder water should certainly be enjoined; directing the successive reductions of temperature to be gradually performed. And in cases where a determination to the head is indicated by unusual heat of that part, by turgescence and redness of the face, redness of the eyes, delirium, &c. the coldest water should be applied; and, if this fail, powdered ice in a bladder, as recommended by Doctor Rush in yellow fever.†

It would require much detail to enumerate all the advantages of these applications. Besides obviating dangerous determinations, and affording great refreshment, they save a great expenditure of excitability, and thereby preserve, from an unavailing and noxious waste, such a portion of vital power, as may become extremely important in the perilous, doubtful, and protracted struggles of the system with this disease.

It would be improper here to pass without notice the efficacy of cold water, or iced water, as the severity of the case may require, injected into the bowels. This operates powerfully, as an anodyne, sedative, and antispasmodic. Besides actual experience, a striking analogy in favour of this remedy is presented by the instantaneous relief it affords in the retrograde motions of the alimentary canal, which take place in hysteria, mentioned by Dr. Darwin as recommended by Mons. Pomme. Dr. Darwin explains the relief produced in this case by supposing "the inverted motions of the intestinal canal to be checked by the torpor occasioned by cold; or that one end of the intestinal canal may become strengthened, and regain its peristaltic motion by reverse sympathy, when the other end is rendered torpid by ice-water." This remedy, though generally adviseable, appears to be most adapted to that state of the disease, when the alimentary canal

* Darwin's Zoonomia, vol. ii. p. 213.

† Medical Inquiries and Observations, vol. iv. p. 91.

has been previously well emptied of its acrid and offensive contents.*

In addition to the common applications to the epigastrium, or other convenient parts, blisters are well adapted to effect a change in the state of the alimentary canal. If the propriety of applying them in the early part of the disease be doubted, they must be thought unequivocally proper, after the canal shall have been emptied of its impurities, and the skin become generally cooler and paler than at the beginning. Sinapisms would probably answer very well in many cases; they are less painful and troublesome than blisters; and, if not suffered to lie on too long, will produce no disagreeable effects.

When the disease is sufficiently subdued, and the retentive powers of the stomach re-established, it will be necessary to have recourse to the common corroborant remedies of the vegetable kind. Among these, none have succeeded so well, in my hands, as infusions or decoctions of Columbo root, or Angustura bark.

* The Spanish physicians (says Cleghorn) have often assured me, that they found nothing more beneficial in violent deplorable choleras, than drinking of COLD WATER. The same practice is recommended by many of the ancients. Sin autem omnia antiqua stercora dejecta fuerint, et bilioſi humores transierint, bilioſuſque vomitus et diſtenſio adſit, faſtidium, anxietas, virium labefactatio, tunc frigidæ aquæ cyathi duo aut tres propinandi ſunt ad ventris aſtrictionem, ut retrogradus humorum curſus cohibeatur, atque ſtomachus ardens refrigeretur. Aſſidue vero id, quum potam aquam vomuerit, facito. Aret. Cappad. de curat. M. A. l. ii. c. iv. See likewiſe Cæl. Aurel. de morb. acut. l. iii. c. xxi. Cleghorn's Diſeaſes of Minorca, p. 243.

ARTICLE V.

The Speech of FOURCROY *in the* Council of Ancients, *delivered in the Session of the* 10*th of Ventose, (February* 28, 1797*) on "the Resolution relative to Powder and Salt-petre Manufactories." Translated, from* The National Gazette or Universal Monitor, *of the* 5*th of March*, 1797, *for the* MEDICAL REPOSITORY.

I HAVE reflected on the objections which have been made to the Resolution under consideration. I foresaw that they would be suggested: they have often occurred to my own mind; but an attentive examination has never failed to convince me that none of them ought to prevent the adoption of this Resolution. Some are unfounded; others are feeble; and, as to the importance of others, they are so intimately interwoven with the very nature of things, that they would equally apply to any law which could be proposed.

It is desired that the manufacturers of salt-petre shall be bound to make compensation for the materials that are to be lixiviated. This regulation was included in the original Resolution, which you have rejected. It has been omitted in the present, because it would impede the collection of salt-petre, and because it might give rise to an unfortunate competition between the manufacturers, who, under the pretext of bargaining for the materials *(remblais)*, would arrange the matter with the proprietors, and outbid each other. This regulation would be injurious; for the harvest of salt-petre will be diminished, if the manufacturer is obliged to pay for the substances which are to be lixiviated. Beside, this is altogether unnecessary, as it is for the interest of the manufacturers to replace them; which they seldom neglect to do.

The article that authorizes the *fouilles*,* has been particularly objected to; and the objectors have cited the efforts of the Ancient Government, made under the direction of a philosophical minister, to put an end to the constraint and vexations to which the people were exposed on this account. It is a misfortune of our climate, that the formation of nitre, among us, takes place only around our

* FOUILLE, fing. FOUILLES, pl. is a privilege granted to the manufacturers of salt-petre, to DIG UP and remove the earth of the cellars, vaults, &c. of the citizens in general, for the purpose of lixiviating it, and extracting the nitre. The great and weighty objection to the FOUILLE is, that it affords a pretext for entering private houses at all times, and exposes the inhabitants to the most tyrannical inspection, at the pleasure of those to whom this privilege is granted.

dwellings; but it is not the less necessary to collect it for our defence. The chemists have proved, that the salt which is obtained in those places, which have been hitherto subjected to the *fouille*, is nitre with an alkaline base, (nitrate of pot-ash) which scarcely needs refining; while that which is found among marble, granite, and lime-stone, is nitrate of lime, (calcarious nitre) and requires the most tedious processes to render it fit for use.—When TURGOT, in connection with the venerable LA ROCHEFOUCAULD, attempted to suppress the *fouilles*, his real object was the suppression of artificial nitre-beds. The proof of this is to be found in an Arret of the 8th of August, 1777, which ordains—That the communes that should establish artificial nitre-beds should be exempted from the *fouille;* and that private persons, who should construct similar nitre-beds, should be exempted from the poll-tax, road-tax, and militia duty. Another edict, of about the same date, ordains—That the suppression of the *fouille* should not take place till after the establishment of the artificial nitre-beds. So that it is not accurate to say that the *fouille* has been abolished; and if we take for our rule of conduct that of the former government, which has been much commended on this occasion, *we* shall not abolish the *fouille* till after the establishment of the artificial nitre-beds.—I acknowledge that it is an unpleasant and vexatious restriction; and I had much rather that it were abolished. But when it comes to be understood, that its continuance is only necessary till something better can be substituted, I see no room for hesitation.—The law must be carried into effect; and they who resist its execution must be punished.

Our colleague, PORCHER, supposes that the manufacturers, accustomed to a different mode than that proposed in the resolution, will not follow the new process of washing the salt-petre. The manufacturers themselves have answered this objection, in their replies to my Memoir—where they acknowledge, that nothing can be more simple than this process. And what demonstrates the necessity of adopting it is, that, hitherto, for want of a *certain* method of trying nitre, the government has suffered an annual loss of eighty millions of salt-petre.—The 13th article, according to the new premium, doubles that of 1790, suppresses the excess *(bonification)* of four per cent. and the delivery of pot-ash. It is a necessary consequence of the preceding; and will oblige the manufacturers to make use of ashes and other alkaline substances, whose loss will require expensive purchases. At the same time, it will increase, in France, the production or preparation of pot-ash, which we draw, at present, with great expence, from the north of Europe and America, whilst a crowd of vegetables—parasite, and even noxious plants, that infest our roads, hedges, and ditches—barks, wild fruits, and the remains of certain plants, of

which no further use can be made, might become, without injury to agriculture, (from whom we should never take more than the excess of what is requisite as manure,) inexhaustible sources of this alkali—still more useful in many other arts than in the manufactory of salt-petre.

Our colleague, IMBERT, seems terrified at the prospect of the expence which will follow the establishment of the nitre-beds. To relieve him from his apprehensions, and to shew the Council how little foundation they really have, it is incumbent on me to declare, that the greater number of the proposed establishments will require no new locations; and that those already in the possession of the administration, will not only suffice in the outset of the business, but that it will be necessary to appropriate only a small part of them to this purpose. All that is to be done is, to dig a few pits; to construct a few slight sheds, with poles, and a covering of thatch; to carry thither earths already lixiviated, the scattered and fine dirt made by pulling down old buildings, marly and chalky earths; to add to these the scum of *rafineries*,* the straw and chaff of worn-out beds, the half putrefied remains of vegetables; to moisten them with dirty liquids, such as water from the common sewers, from the sinks of kitchens, urine, and other matters of the like kind, which are of very little use for other purposes; to stir these heaps from time to time; and to lixiviate them when the salt-petre is formed. Here is nothing which requires great expence. The most material things—the situations for carrying on the business, as well as the utensils,—exist already. The substances which produce the acid and become nitrified will require no further trouble than to collect, heap them up, and stir them. The workmen employed in refining nitre and manufacturing gun-powder, will suffice; or, at most, a very small number only will be requisite for the additional labour of these establishments.

Nitrification was long a mystery to chemists, before they learnt how to seize upon, distinguish, and fix those fugitive and volatile substances, known at present by the name of elastic fluids, or gases. The acid which enters into the composition of nitre, and which is formed by the combination of two of these fluids, was entirely unknown, and its formation still presented to the learned an inexplicable problem. The immortal discoveries of Cavendish, of Priestley, of Lavoisier, and of Berthollet, have taught us that this acid is composed of the same elements with atmospheric air, only under a different form, and in different proportions than those which constitute the atmosphere.

* The ordinary signification of this word is sugar-houses; but it may be used here to denote the houses for refining of nitre.

These facts are indisputably established by experiments, in which the nitric acid is decomposed, and again produced by the union of the original elements. Hence it is demonstrated that it consists of four parts of oxygene, and one of azote. But these two principles, as contributing to the formation of the atmosphere, are in the proportion of a little more than two parts and a half of the first, and one part of the second; and exist in an uncombined state, separately dissolved in a common menstruum, and without the possibility of contracting a real chemical union. Hence it arises, that atmospheric air is never spontaneously converted into nitric acid; and that, after augmenting the proportion of oxygene gas, if the electric spark is passed through this new mixture, a few cubic inches only are acidified, in the delicate experiments known and verified by the greater part of the natural philosophers of Europe. But this acidification, to which the beneficence of nature has placed an insurmountable obstacle, in the atmosphere, (which ought always to maintain the equilibrium of its composition, for the preservation and continuance of vegetable and animal life,) takes place, always, when substances, into whose composition azote enters, are exposed to a stagnant air, that envelopes and penetrates them. Then, in proportion as the azote, freed from the bonds of its primitive connection, tends to disengage itself, and assume the nascent state of an elastic fluid, it gradually unites with the oxygene of the atmosphere, which it absorbs with avidity, and forms the nitric acid, as soon as one part of the former of these principles is associated with four parts of the latter.

It is in this manner that vegetable and animal substances that contain a large quantity of azote in their intimate combination, and which is slowly disengaged in consequence of their spontaneous decomposition, produce the nitric acid whenever, after having been slightly moistened, they rot in an atmosphere but little agitated. It is thus that the earth of stables, studs, folds, barns, vaults, and cellars, impregnated with liquors, fragments of viands, or the humid dust of vegetables and animals, acquires, after a certain period, that acid which it did not originally possess. Farther, it is by this means that this very earth or soil, taken out of the vaults which contain it, and which are often very imperfectly ventilated, and exposed to a free air, becomes more enriched with the acid, in a few days, than it would have been in some months, without atmospherical contact. Finally, it is by the operation of the same natural cause that the soft calcareous stones that are dug up in the fine countries, bathed by the Indre and the Loire,—materials naturally abounding with one of the elements of the nitric acid, without containing an atom of it while they are buried under the soil,—become impregnated with it, with a readiness and abundance equally astonishing, when exposed to the

air. And these important truths, of which the world was wholly ignorant till within the last fifteen years, have been incontestibly demonstrated by the ablest philosophers and the most learned and illustrious chemists of Europe. The researches and celebrated experiments by which this beautiful theory has been developed, are contained in the memoirs and works of Cavendish, Priestley, Lavoisier, Berthollet, Kirwan, Van Mons, Chaptal, Gren, and Scherer, all men upon whose discoveries and labours Europe and the whole learned world have now their eyes fixed, and whose names will never be pronounced by a grateful posterity but with respect and a tender remembrance of the benefits derived from their exertions.

But it is not sufficient to comprehend, how perfectly soever, the formation of the nitric acid. For, after all, this acid constitutes but the one half of nitre or salt-petre. If, in proportion as it forms, it does not find a base capable of absorbing it, an alkali able to retain and confine it, it flies off, and is dissipated in the air.

Nitre results from the saturated union of the nitric acid and a fixed alkali, called pot-ash, in nearly equal parts. This species of alkali is abundantly found in vegetables; and it is on this account that the salt-petre which is extracted from caves, cellars, coach-houses, and barns, is purer and richer than that which is extracted from nitrified stones, the ruins of walls and plaister. Those departments, so fertile in nitrous salts, of which I spoke but a moment since;—those countries, bathed and encircled by the Loire, the Indre, and the Mayenne; those cantons of whom Saumur has long been the center, and whose name SALMURIUM, *sel de mur*, *sel de muraille*, discovers the ancient manner of abundantly extracting salt-petre, furnish us only with calcarious nitre, or the union of the nitric acid and lime; because the lime-stone, which becomes nitrified in the air, contains no alkali; so that, to obtain real nitre, a salt which will not *give* in the air, and which will answer in the fabrication of gun-powder, we are obliged to decompose this earthy salt, this natural mother-water, to precipitate the lime, and substitute the alkali. This requires the consumption of a large quantity of pot-ash, and ought to convince the administration that, to carry the production of the salt-petre of these rich central departments to the height which it ought to attain, it is necessary to create and render domestic the art of making salt and pot-ash, as has been attempted with some promise of success. It has been already shewn why, and in what manner, the liquid, or moistened solid, remains of vegetables and animals, mixed with light calcarious and marly earths, suffered to putrefy, in a sheltered place, where the air slowly circulates, whose surface is occasionally changed, and which contains, at the same time, one of the con-

stituent elements of the nitric acid, and the alkaline base with which this acid unites to form nitre, produce this salt by absorbing one of its most abundant principles, or three fourths of its weight, from the atmosphere.

It must be confessed that this art, founded on a theory as simple as perspicuous, can oblige nature to produce salt-petre, by uniting, under suitable circumstances and conditions, the materials which enter into its composition; and favouring their combination by processes resembling those which nature herself employs, the secret of which we have at length discovered. For it is no longer to be doubted that the salt-petre which forms itself, under our eyes, in soils soaked by vegetable and animal juices, or in stones impregnated with the same juices or their vapour, (the materials which compose the floors and the walls of our stables, folds, vaults, coach-houses, &c.) represent in this respect, real artificial nitre-beds: to imitate whose proportions and processes is all that we aim after. And this is what the latest and most precise data on the formation of nitre-beds would induce us to do, for the erection of these establishments, almost without expence and original cost. "Without the apparatus of extensive artificial nitre-beds," (says one of our most celebrated and most useful French chemists, citizen BERTHOLLET, in one of his excellent lessons at the Normal School)—"an immense quantity of salt-petre may be procured, through the whole extent of the Republic; if the strata of "earth which are to be found under the dung-hills of sheds and "stables were to be collected from time to time; if the substances "that have been already lixiviated were substituted in their place; if "this earth were then mixed with remains of vegetables; if this "mixture were moistened with the waters collecting occasionally "on the surfaces of dung-heaps then, by proceeding to lixiviation "and evaporation, a succession of operations might be established "equally beneficial to the national interest, and that of individuals."

In short, if any thing further be required to demonstrate, that the success of artificial nitre-beds is certain, we may cite the example of those which have been established in Sweden, in Prussia, in the Canton of Appenzel, at Malta, in China, and in India: that of Dijon, for which we are indebted to the exertions of our fellow-citizen GUITON-MORVEAU, already produces 15 millions of salt-petre annually; that of Auxerre, 10 millions; and those of Caën, of Chalons-sur-marne, and Troyes, afford results equally satisfactory.

REVIEW.

[☞ *Under this title it is intended to include a review not only of late medical publications, strictly so called, but also of all such publications concerning agriculture, and other branches of natural history, natural philosophy, &c. as may in any wise relate to the objects contemplated in the plan of the Medical Repository.*]

ART. I. *Medical Inquiries and Observations:* Containing an Account of the bilious remitting and intermitting Yellow Fever, as it appeared in *Philadelphia*, in the year 1794; together with an Inquiry into the proximate Cause of Fever; and a Defence of Blood-letting, as a Remedy for certain Diseases. By *Benjamin Rush*, M. D. Professor of the Institutes, and of Clinical Medicine, in the University of Pennsylvania. 8vo. pp. 258. *Dobson.* Philadelphia. 1796.

THE present work may be considered as the sequel of a former, on a similar subject, which the public has received from the same author. It should serve to alleviate our recollection of the ravages occasioned by the disease here treated of, to observe, that we owe to this cause an increased zeal for medical inquiry, much various disquisition of importance, and several publications likely to produce lasting benefit to the science of medicine. To derive improvement from calamity, and thereby to convert misfortunes into blessings, is a mode of exertion, in which active and enterprizing minds have been often engaged with much success. It requires promptitude, freedom, and boldness of thinking, and the wide range of a mind, unawed by authority, and unfettered by the shackles of a preconceived system.

The disease which produced the present, and the former work, was, in several respects, most remarkable. Relinquishing the tameness of common forms, and the blended and insidious colouring, which often, in our observation of epidemics, tend to perplex and confound; it assumed a definite and striking character, not only calculated to disclose its own nature, but also to throw light on the general doctrines of diseases. The author has availed himself of this advantage with great ability. Perceiving at an early period of the epidemic, that the moment of important observation was arrived, and that nature might then be subjected to a close inspection and decomposition of her morbid operations, he

watched, and scrutinized, and penetrated, with a degree of ardour, assiduity, and success, which do him great honour. And we find ourselves at a loss which most to admire, the humanity that impelled him to such labours, or the force of mind, and felicity of investigation, which conducted him in his researches on this subject.

This work, as is indicated by the title page, consists of three principal parts. The first contains "An Account of the bilious remitting and intermitting Yellow Fever, as it appeared in Philadelphia, in the year 1794." And this, therefore, comes in the first place under our consideration.

Dr. Rush begins by remarking, that the fatal epidemic of 1793 was succeeded by diseases of a highly inflammatory nature. The same disposition was continued throughout the spring of 1794. Intermittents were more obstinate than common, and yielded not to the largest doses of Peruvian bark; and, in one case, an internal dropsy of the brain, produced by that remedy, could only be overcome by blood-letting and other evacuations.

From the inflammatory complexion of the diseases of the winter and spring, our author expected to find the fevers of the summer and autumn of a violent and malignant nature. This opinion was strengthened by observing the filth, allowed to accumulate in the gutters of the city, and inattention to other important objects of police.

Early in June, appearances of the Yellow Fever were observed; and during the remainder of that month, several cases occurred to Doctor Rush himself, displaying the unequivocal character of the disease, and attended with considerable degrees of violence. In the course also of this month, many cases of swelled testicles, succeeding slight attacks of fever, took place, not dissimilar to instances of swelled testicles, recorded by Doctor Desportes, in an account of the Yellow Fever which prevailed at St. Domingo, in the year 1741.

In July and August, the disease shewed a disposition to spread still more. It often appeared disguised under the forms of cholic, pneumony, and hemorrhagy. The cholera infantum was common during these months; and was more obstinate and fatal than usual.

From the influence of occasional showers of rain, in the months of September and October, the disease was frequently checked. It was observed, however, that while showers of rain checked it, moist or damp weather, without rain, favoured its propagation. The cold weather in October restrained, but did not extinguish the fever. It appeared in November, and in all the succeeding winter and spring months; owing probably to the mildness of the weather in those seasons.

The causes, which predisposed to this fever, were the same as

in the year 1793. Persons of full habits, strangers and negroes were most subject to it.

Summer fruits, improperly used, terror and vexation, were sometimes observed to act as exciting causes of this disease.

Two premonitory symptoms struck the author this year which had not been observed in 1793. A frequent discharge of pale urine for a day or two before the commencement of the Fever—and sleep unusually sound the night preceding the attack. The former symptom was a precursor of the plague of Bassora, in the year 1773.

In the arrangement of the symptoms of this fever, the author follows the order adopted in his account of the Yellow Fever of 1793, and describes them as they appeared in the sanguiferous system—the liver, lungs and brain—the alimentary canal—the secretions and excretions—the nervous system—the senses and appetites—upon the skin, and in the blood. This detail of symptoms is delivered with great precision and accuracy, and certainly forms a very interesting part of the history of the disease; but as it does not materially differ from the account of the disease in 1793, our limits do not permit us to enter into particulars on this point.

The forms in which this fever appeared were the following—a tertian, most frequently a remittent, with evening exacerbations—it assumed, in several instances, the symptoms of cholic, cholera, and dysentery—once it appeared in the form of apoplexy—it was disguised in the form of madness—late in the season it was accompanied with symptoms of pleurisy—it attached itself to puerperal fever—even dropsies partook of its character—it blended itself with scarlatina, measles, small-pox, gout, &c.

The predominance of this disease, and of powerful epidemics in general, over other diseases, is strenuously maintained by the author. His former proofs on this head are reinforced by some additional instances, and illustrated by further reasoning.

This fever was contagious in very few instances, compared with that of the preceding year. The contagious quality was by no means confined to the most malignant degrees of the disease. And in many cases, where fever was not excited, peculiar effects of the contagion were discoverable in different parts of the body.

The common modes of preventing the action of contagion on the system, during this epidemic, as well as that of 1793, not only failed, but probably favoured the spreading of the disease. Temperance, a vegetable diet, with such addition of aromatics as may be necessary to preserve the tone of the stomach and bowels, and occasionally gentle doses of physic, seem to be best calculated for this purpose. The effects of smoke in destroying contagion are particularly commended.

From the means of securing individuals from contagion, Doctor

Rush passes on to give directions for preventing its admission and propagation in cities. To accomplish this, he would have physicians compelled to disclose the existence of contagious fevers—if imported, that the importing vessel be removed to a proper distance, and purified—if of domestic origin, that the putrid sources of exhalation be destroyed—and meanwhile, that all the families within fifty yards of the infected person or persons, be ordered instantly to remove into houses or tents, provided at the public expence, and that all access to the sick be denied, except by physicians and nurses.

The author, notwithstanding these directions for arresting the progress of contagion, is far from admitting, that a contagious disposition is one of the characteristic marks of this disease. On the contrary, he contends, it is accidental, depending on circumstances of different seasons, countries, &c.

The origin of this fever, in the next place, claims attention. It is asserted to have been evidently produced by exhalations from the gutters, and the stagnant ponds of water in the neighbourhood of the city. Where there was most exhalation, there were most persons affected by the fever.

What the exact state of the atmosphere is, which disposes to malignant fevers, Doctor Rush supposes to be difficult to determine. Two things with respect to it are obvious—it pervades, at the same time, a great extent of country—and it continues, for several years, under all the circumstances of wet and dry, of hot and cold weather. This morbid peculiarity is suspected by our author to be the effect of a preternatural quantity of the oxygenous portion of the atmosphere.

With much of the caution and diffidence which become a philosopher, in treating a subject not yet satisfactorily developed, Dr. Rush offers this conjecture. As this is a subject on which different opinions are held, and as it is probable many persons may not consider our author's arguments on this point as conclusive, it will not be deemed improper to state some of the objections which lie in the way of his hypothesis.

1. This opinion seems to derive no support from eudiometrical experiments, nor any other direct proof hitherto laid before the public.

2. It seems to be rendered improbable by the season of the year, when these malignant fevers are most apt to prevail; that is, the latter end of the summer and the autumn. If any material variation, as to the relative quantity of oxygene air, at different seasons, should hereafter be found to take place, it would seem probable that it is most scanty in the season just mentioned. A considerable proportion of vegetable substances is then dead; and even the living vegetables, a principal source of that air, have, at that

time, much declined from the fresh vigorous and healthy state in which they emit the most copious supplies of it.

3. That a greater proportion of oxygene air exists in the atmosphere in the winter, spring, and early part of the summer, than during the remainder of the year, seems to be rendered probable by the brighter and more florid complexion of people generally at such seasons, and by the nature of the diseases then most apt to prevail. And, in further confirmation of this, it may be observed, that during the usual epidemic season of these malignant fevers, paleness and sallowness of complexion are commonly found to predominate.

4. If an increased proportion of oxygenous air predispose to malignant fevers, it would scarcely seem probable, that the atmosphere of the country should so generally resist the spreading of that contagion as experience testifies.

5. No uniform, general, or even frequent appearances, in the circumstances of blood-letting, seem to warrant this opinion.

6. Our author himself recommends *vegetable* diet, as one of the best preventives of malignant fevers; and orders *acidulated drinks* in the course of the disease. It is difficult to imagine how the acknowledged usefulness of this diet, and these drinks, can consist with a predisposing prevalence of the oxygenous principle in the atmosphere.

7. The late experiments of Dr. Carmichael Smith appear to militate against this opinion. The fumes, produced according to his directions, to destroy contagion, consist, as Mr. Keir asserts, of highly oxygenated nitrous vapour, mixed with a large quantity of pure oxygene air.

The specific nature of the exhalations which induce these diseases, our author declines to decide. Besides their effects on the human system, he mentions several instances of their violent operation on domestic animals, and particularly on cattle, fed upon marshy pasture in autumn.

Dr. Rush proceeds, in the next place, to deliver an account of the method of cure. The remedies used in this fever were the same he had employed the year before. And the treatment consisted,

1. In the abstraction of the stimulus of blood and heat from the whole body, and of bile, and other acrid humours, from the bowels, by means of the following remedies: Bleeding, purging, cool air, and drinks—cold water applied to the external parts of the body, and to the bowels by means of glysters.

2. In creating a diversion of congestion, inflammation, and serous effusion, from the brain and viscera to the mouth, by means of a salivation, and to the external parts of the body, by means of blisters.

3. In restoring the strength of the system, by tonic remedies.

Under the head of bleeding, the author observes that this fever differed from that of 1793, in coming forward, early in the season, with a number of paroxysms, which refused to yield to purging alone. He, therefore, began the cure of every case he was called to by bleeding. And it is only by contemplating the extent in which it is necessary to use this remedy, in order to overcome a yellow fever, that we can acquire just ideas of its force.

On the subject of purging, but little is added to the observations made upon that remedy in the year 1793. Jalap, calomel, and gamboge were used until large and dark-coloured stools were obtained; after which the bowels were kept gently open every day with castor oil, cream of tartar, or Glaubers' salts. Calomel was given in much larger quantities than in the preceding year.

Cool air and cool drinks, cleanliness, cold water applied to the external parts of the body, and injected into the bowels by way of glyster, did great service. Pains of the head, and of the bowels, were relieved by cloths, dipped in cold water, and applied to those parts. The coldness of pump water, when used in this way in 1795, was increased by dissolving ice in it, and, in some cases, powdered ice was applied in a bladder to the head with great advantage.

Salivation was excited, as early as possible, in all those cases which did not immediately yield to bleeding and purging. It were greatly to be wished that the use of this remedy should be rendered universal in the treatment of malignant fevers.

Blisters, when applied at a proper time, did much service. This time was, when the force of the fever was so far reduced by evacuations, that the stimulus of blisters sufficed to carry off the remainder of the disease.

After the reduction of the morbid action of the blood-vessels, by the remedies mentioned, Dr. Rush seldom made use of any other tonic than a nourishing and gently stimulating diet. This consisted of summer fruits, bread and milk, chicken broth, the white meats, eggs, oysters, and malt liquors, more especially porter.

Peruvian bark was commonly found ineffectual, and in many cases manifestly hurtful in this disease. Columbo root, the Carribean bark, and other bitters were attempted to be substituted for it, but without success.

Wine was hurtful in every case of Yellow Fever, in which it was given while there were any remains of inflammatory action in the system.

Opium was observed to be less injurious in this fever, than in that of 1793.—Nitre and antimonials were offensive to the stomach, and altogether useless.

With these observations our author concludes the history of the symptoms, origin, and cure of the Yellow Fever, as it appeared in Philadelphia in 1794, and in the winter of 1795.

We exceedingly regret, that it is not in our power, consistently with our limits, to give a more detailed account of this part of our author's work. A great number of his proofs and illustrations, very material to a due understanding of his opinions, are unavoidably passed without notice. For a satisfactory view of these, we must refer the reader to the work itself.

The additional proofs of the domestic origin of the Yellow Fever, here adduced, together with occurrences, which have taken place in other parts of the United States, must, we apprehend, have long since removed every doubt on this question.

The mode of treatment, adopted by our author, was, in an eminent degree, simple and energetic; and, notwithstanding every inference that can be drawn from a few unfavourable cases, was singularly successful.

[*To be continued.*]

ART. II. *A Memoir concerning the Fascinating Faculty which has been ascribed to the Rattle-snake, and other American Serpents.* By *Benjamin Smith Barton*, M. D. &c. Philadelphia. *Sweitzer.* 8vo. pp. 70. 1796.

IT appears from the preface to this Memoir, which is inscribed to the late amiable and ingenious Dr. Rittenhouse, that it was originally read in the American Philosophical Society, and is expected to form a part of the next volume of its Transactions. Dr. Barton assigns as reasons for a separate publication, a desire of "distributing it among his friends, and those who are curious "of researches in natural history." He also informs us, that the Memoir in question has received considerable additions, since its first reading.

Our readers are well informed of the various opinions which are entertained on the subject of the paper before us; of the contradictory explanations which have been offered; and of the doubts which have been entertained of the reality of the fact termed Fascination. We shall detain them, therefore, no longer from the Memoir; from which they may naturally expect to derive entertainment, judging from the author's well-known ingenuity in this kind of investigation.

The Dr. commences his inquiry into the nature of Fascination, and the reality of the Fascinating Faculty, by remarks on the extent of the conviction of its truth,—which he does not hesitate to

call a prejudice;—and by a description, chiefly after Professor KALM, of the manner in which the supposed fascination is effected. As there is nothing new or peculiar in this description, it is unnecessary to lay it before the reader. The author, next, examines into the origin of this belief, or prejudice. He finds no traces of it in the writings of the Ancients, which have been subjected to his inspection. He even questions the correctness of the opinion of Dr. Cotton Mather and Mr. Dudley, that it originated among the Indians of North-America. He observes that this belief is by no means *now* prevalent among our Aborigines; and that the veneration accorded to the rattle-snake, by some tribes, may, with great probability, be ascribed to a superstitious fear of its power to injure them—founded on their religious notions. Finally, on this point, he remarks, that there is no evidence of the existence of this prejudice among the native Indians of South-America.

From this fruitless attempt to discover the native country of the opinion which he combats, Dr. Barton enters into an enumeration of the principal authors who have supported, or have doubted of its validity. Linnæus, Gmelin, Kalm, Dr. Samuel Johnson, Mr. Bartram of Philadelphia, &c. are ranged in its favour; Dr. J. E. Smith and Mr. Pennant appear to entertain suspicions of its truth. But a much larger portion of the Memoir is devoted to an examination of two distinct explanations, of fascination, offered by M. de la Cépede, in his "Histoire Naturelle de Serpens;" whose words Dr. Barton quotes at length. The first solution of M. de la Cépede is, that what is called fascination is effected by *the pestilential breath of the serpent, or by noxious effluvia exhaling from his body.* In opposition to this idea, Dr. Barton affirms, that persons have taken the head of the black, and other snakes, into their mouths, without injury, and without perceiving any bad smell; that he has been present when a small box, in which a number of serpents had been confined, was opened in a small, warm room, without being sensible to any peculiarly offensive odour; and that a gentleman of his acquaintance, who has long had a rattle-snake under his immediate care, has never observed any disagreeable vapour to proceed from it.* Not-

* In some parts of the United States it is not uncommon for persons to fasten the live rattle-snake to the earth, (by means of crotched sticks at the head and tail,) and then to bite this reptile, through the back, from one extremity to the other. This is done from a persuasion that those who perform this strange act will thereby secure themselves from all pain and decay of the teeth. The snake is supposed to bear off every thing which tends to promote disease in the teeth. The writer of this article has seen two persons, and one of them a physician, who, when boys, had made the experiment. Were the effluvia of the serpent very noxious, this attempt would, probably, have proved fatal.

withstanding, our author acknowledges that the testimony of men of indisputable veracity leaves him no room to doubt but that an odour, exceedingly unpleasant, does emanate from this and some other species of serpents. But, observes our author, birds have been inclosed, with these serpents, in the same cage, without suffering any inconvenience; and birds are often known to sit over their eggs, hatch, and rear their young, on the branches of bushes at whose roots the rattle-snake lay. This serpent, too, is often preyed upon by the eagle, the hawk, and other birds, without their, or their young, suffering any injury in consequence. The first explanation, therefore, of M. de la Cépede is not admissible.

The reasons assigned by Dr. Barton for rejecting this solution of the Continuator of Buffon, are of various importance. No great evidence seems derivable, on either hand, from the fact of the presence, or absence, of fœtid emanations. The most offensive odours are often harmless, so far as the health of those exposed to them is regarded; and the most subtle poisons are frequently destitute of any peculiar pungency of smell. But if Dr. Barton have displayed no remarkable ingenuity in this part of his Memoir, it may be observed that no great strength of argument appears requisite to refute so improbable a suggestion as that of M. de la Cépède.

The second explanation proposed by the French Naturalist is, that, *in cases of supposed fascination, the birds and other animals, thought to be fascinated, have been previously bitten by the serpent; and that their cries, efforts, and apparent agonies, are the effects of the poison:* and such appears to have been the opinion of Sir Hans Sloane, and of the author of the article in the Monthly Review, which contains an account of M. de la Cépède's work. But Dr. Barton rejects this solution equally with the other. He observes, in the first place, that the effects attributed to fascination bear no resemblance to those known to be produced by the poison of the rattle-snake—for a description of which he refers to a paper inserted by him in the third volume of the Society's Transactions;—and he dwells with emphasis on the well-established fact of the animal's having often survived, after having been subjected to fascination, when the serpent had been seasonably frightened away. In the second place, the Doctor remarks, that the fascinating faculty is by no means confined to the rattle-snake, but is predicated of various other serpents, particularly the black-snake, who are known not to be venomous. M. de la Cépède's second explanation is, therefore, alike insufficient with the first.

This argument, we confess, appears to us conclusive; and two

facts which will come to be stated, in the course of this article, add strong confirmation to its truth.

The last opinion examined by Dr. Barton, is that of Professor Blumenbach, of Göttingen, who ascribes the power attributed to the rattle-snake, *to his stedfast looks, and to the hissing noise of his rattles, by which he entices the birds, &c. to follow him:* and the Professor observes, that this last circumstance is perfectly analogous to the practice of the Indians, who, by imitating the noise made by this serpent, allure and take squirrels.

In reply to this, Dr. Barton remarks, 1. That serpents unprovided with rattles, are equally successful as the rattle-snake: 2. That, from good information, he has reason to believe, that this serpent does not always shake his rattles, in the act of charming; and 3. That M. Blumenbach has probably mistaken the artifice of the savages, to which he alludes, for their practice of imitating the cries of young birds, and by that means enticing the parents within reach of their arrows.

Having thus carefully examined the opinions of his predecessors in this inquiry, Dr. Barton now proceeds to state his own opinion, together with the facts on which it is founded. We shall follow his arrangement as nearly as will consist with the limits of this part of our work, and without neglecting the justice due to the author.

Before any decisive judgment should be hazarded on the subject, Dr. Barton informs us, he deemed it necessary to ascertain—"First, what species of birds are most frequently observed to be "enchanted by the serpents; and, secondly, at what season of "the year has any particular species been most commonly seen "under this wonderful influence." The result of his investigation and observation, with relation to these points, is—

1. That all the birds, said to be fascinated by the rattle-snake, build on or near the ground.

2. That the season when fascination is agreed to be most common, is that in which the birds lay, sit, and hatch.

3. That the rattle-snake is a slugglish reptile, and unable to climb to any height; but that the black-snake is able to glide up the highest trees, and is often seen to mount their tops, when impelled by hunger, in search of prey.

4. That the principal food of the rattle-snake is the *Great-frog** of our rivers, creeks, &c. On dissecting many of this species of serpent, no other animal has been found in its stomach, save in one or two instances; and then the animals were such as dwelt on the ground.

5. That the black-snake chiefly preys on birds; his superior activity enabling him to assail the nests, in the absence of the parent bird, and destroy the eggs, or bear off the young.

* Rana ocellata of Linnæus.

These facts being established, the inquiry naturally recurs, for what end were the serpents endued with the fascinating faculty? The uniform reply, Dr. Barton remarks, is—to obtain their food.—In shewing this supposed power to be unnecessary, or unemployed, for this purpose, the Doctor derives a new argument against its existence. For, according to him, the rattle-snake only preys on animals within his reach, to take whom he has no need of the fascinating faculty; while the black-snake exerts himself in a surprizing manner to catch a prey that might be easily entrapped were he able to charm it—and Dr. Barton relates (p. 67.) a very striking fact, to prove the labour and art of this serpent, to satisfy his hunger.

Having shewn that the serpents, said to be possest of the fascinating faculty, do not employ it for the only purpose for which it can rationally be supposed to have been conferred on them, all that remains for Dr. Barton is, to explain the effects which have been attributed to this power in a more satisfactory and rational manner. This he endeavours to do, by referring the cries, efforts, &c. of the animals said to be under the influence of fascination, to their anxiety, courage, and exertions, for the protection of their young. On this topic, the Doctor enlarges with much ingenuity; and we regret that we cannot extract the whole of his interesting argument. When the nest, or the young, are assailed by the serpent, Dr. Barton supposes the parent bird to attack him "with her wing, "her beak, or her claws." This is successful, and the reptile is killed, or obliged to fly; or it is unsuccessful; and he first consumes the offspring, and then the wearied and agitated parent. Dr. Barton concludes this part of his argument by relating a fact, communicated to him by Mr. Rittenhouse, which is corroborative of this explanation.

THE reasons assigned, by the author of the Memoir just noticed, for discrediting the existence of the Fascinating Faculty ascribed to serpents, are for the most part satisfactory; and the explanation given by him of the effects attributed to this supposed faculty is, probably, many times just. But, as in all doubtful cases, there is a propriety for every suggestion which may lead to greater certainty, we shall make no apology for proposing, in this place, two additional solutions of the problem before us. We are willing to believe that what is called fascination may, at different times, be attributable to the cause assigned by Dr. Barton, and to each of those which we shall now suggest. The various animals subjected to this pretended power, and the various effects it is described as producing, sufficiently countenance the conjecture.

I. The *cat-bird* is enumerated among those birds that are preyed on by snakes, by means of the fascinating faculty. The artifices of this bird are known to every person conversant with the birds of this country. In the season of rearing her young, if started by a man, she flies along before, with every appearance of concern; agitating her body; frequently alighting; and uttering the most distressful cries. By this means she eludes the search of those who are hunting for her nest. The pursuer is induced to believe it at every place where she alights; and is thus, constantly, led farther and farther from its real situation.—Nor is this artifice peculiar to the cat-bird. Every school-boy has been made the dupe in this way, of many of those birds who nest on, or near the ground.

Is not this the probable history of many instances of supposed fascination? The agitation and cries of the bird are its artifices to mislead the serpent, who is looking for her young. In those instances where the snake discovers them, the artifice proves useless, and the mother may, according to Dr. Barton's explanation, fall a victim to her efforts in their behalf. In other cases, the snake is either drawn away by the deception, or, being frightened from his purpose, *the bird flies off, uninjured by the supposed fascination.*

II. Another supposition which has occurred to us, and which is countenanced by a number of facts, is, that *in those cases where birds, or other animals have died, without any external injury from the snake, they have expired in a paroxysm of fear.*

This conjecture derives no inconsiderable support from the whole conduct of birds, while under the influence of fascination, as described by the advocates for this inconceivable faculty.

On this supposition, there is no difficulty in accounting for the facts related of animals dropping down, suddenly, into the very mouths of the charmers.

The facts stated by Mr. Vosmaër, and mentioned by Dr. Barton, (p. 34 of his Memoir) are in point; as seems, in part, admitted by the Doctor himself. Nor are the experiments made in Philadelphia less in favour of this explanation. The operation of terror will be different, according to its degree. Some animals, and there have been instances among the human species, expire immediately, under its powerful influence. Others, it affects with a temporary torpor. Others, again, it provokes to actions the least favourable to their own designs; and they precipitate themselves into the very danger they would avoid. Some, it furnishes with unusual powers of flight: and some, it arms with all the courage of despair. Indeed, the varieties in the operation of the fabulous charming power of serpents, are not so numerous but that they admit of perfect explanation, on the idea now suggested. Nor will a solitary instance of unconcern in a bird exposed to a serpent

(see Memoir, p. 36.) be sufficient to invalidate the probability of its correctness. Two very curious facts may be added, in support of this conjecture, which, as it appears to us, are not easily to be explained on any other hypothesis. We quote them from the account of "Le Vaillant's Second Journey into the Interior of Africa," given in the Appendix to the xxth vol. of The Monthly Review Enlarged, art. vii. pp. 526, 27. The passage referred to is, in the words of the translator, as follows.

"Casting my eyes on the trees, I perceived a motion in the "branches of that which was nearest us. We presently heard the "piercing cries of a butcher-bird, which was struggling in con- "vulsions. Our first idea was that it lay under the talons of some "bird of prey: but, on surveying it more attentively, we were "surprized to see, on the next branch, a very large serpent, "which, totally immoveable, but prepared to strike, and with in- "flamed eyes, fixed the poor animal. The bird agitated itself, "and struggled in a frightful manner; but fear had taken away all "its powers; and, as if held by the feet, it seemed to have lost the "faculty of flying away. One of us went for a gun: but, before "he returned, the bird was dead, and he shot only the serpent. "I then caused the distance between the two creatures to be mea- "sured, and found that it was three feet and a half; so that all the "company were convinced that the bird could not have perished "by the bite of the serpent. I plucked the bird in their presence, "and made them all remark that it was entire, and had not the "least wound.

"A similar adventure had before occurred to me, in the Canton "of Twenty-four Rivers, which I now related to my companions, "in order to confirm what they had just seen. One day, as I "was shooting in a morass, I heard, on a sudden, very shrill and "painful cries issue from a tuft of reeds. Curious to know the "cause, I approached gently, and saw a little *mouse*, which, like "the butcher-bird, was in a convulsive agony; and two paces "farther, I perceived a serpent looking intently on it. As soon "as the reptile perceived me, he skulked away: but the effect of "his presence had already taken place. Having caught the mouse, "it expired in my hand, without my being able, on the most at- "tentive examination, to discover the actual cause of its death."

We recommend these facts, which would add some plausibility to the idea of Professor Blumenbach, (that fascination is in part effected by the stedfast looks of the serpent,) to the attention of Dr. Barton; and leave our readers to form their own conclusions.

THAT we may not take leave of this subject without some practical advantage to the reader, we shall request his patience, if

we extend this Article to a purpose not altogether disconnected with the question just examined.

Whatever may be true of birds and other small animals, the human species, notwithstanding some ridiculous tales, seem to be in little danger from the fascinating power of serpents. Unfortunately, they are not equally exempt from danger, from the poison of these reptiles. Various vegetable substances are extolled for the cure of the bite of the rattle-snake; but we know not with what reason. It will be some compensation to those who have attended us through the preceding analysis and conjectures, if we shall be able to point out to them a certain and convenient remedy against the venom of this serpent. And such an one we hope is discovered: though we cannot pronounce with certainty till the experiment has been tried.

In a valuable collection of papers, intitled—"Dissertations and Miscellaneous Pieces relating to the History and Antiquities, the Arts, Sciences, and Literature of Asia," by Sir William Jones and others, vol. ii. p. 222, there is an interesting paper "On the cure of persons bitten by snakes, by John Williams, Esq."—The paper consists of the history of seven cases of persons bitten by snakes, with remarks. These, the author affirms, were selected by him, from a number of similar cases, in which his remedy had proved equally successful. Most of the instances, here related, are of bites by a serpent which Mr. Williams calls the *Cobra de Capello;* but he assures us that the means he employs are alike efficacious in the cure of the bite of other serpents.

The operation of the poison of the East-India serpents is very rapid. In a few minutes, those who are bitten are affected with pain, giddiness, stupor, convulsions—particularly of the jaws, and a profuse discharge of saliva. The affections of the throat, the author remarks, are constant symptoms of the poison of the *Cobra de Capello.*

The cure consists in the immediate application of a ligature around the limb bitten, so as to prevent the return of the venous blood to the heart; in washing the wound with *Volatile Caustic Alkaline Spirit;* and in the repeated administration of the same medicine, in doses of from 30 to 60 drops, in water, every five, eight, or ten minutes, till the patient is completely relieved.

The author lays some stress on the use of the ligature; yet it is probable that he is mistaken in supposing the poison to be transmitted by the veins; and it may be remarked, that the ligature was applied in but two of the seven cases he has recorded.*

* The abſorption of the poiſon can only take place by the lymphatics. If compreſſion anſwer any good purpoſe, it muſt be by impeding circulation in them. They tranſmit the venom to the heart; and it muſt be through their agency that the changes ſaid to be wrought in the blood, by the poiſon of ſerpents,

Though the medicine is directed to be administered immediately, yet one instance occurs of its obviating the effects of a bite, which had been inflicted more than an hour. And Mr. Williams declares, that he never knew it fail, if the patients were able to swallow it.—Relief is generally given in a few minutes; and most of the cures are completed within a few hours—some in half an hour.

It is not essential to use the *Volatile Caustic Alkali Spirit;* tho' it is to be preferred, as the dose is more easily ascertained. Where it is not to be had, *Spirits of Hartshorn*, of *Sal Ammoniac*, &c. may be employed; increasing the dose in proportion. One of the cures, related by Mr. Williams, was made by *Eau de Luce.*

The uniform success of this medicine—the Volatile Alkali—in the cure of the bite of Asiatic serpents, and the probable analogy between all animal poisons, induce us to recommend a trial of the remedy to our country practitioners, on the first occasion. We shall be gratified to receive communications on this subject; and still more gratified if they convey to us assurances of the efficacy of the remedy proposed.*

Another important inquiry, suggested by the paper we have just mentioned, is—as the *Volatile Alkali* is so successful in the cure of those who are poisoned by the bites of serpents; as the inseperable symptoms of the venom of the *Cobra de Capello* bear a striking resemblance to those which accompany the disease known by the name of *Hydrophobia*—viz. spasms of the glottis, locked-jaw, and a profuse discharge of saliva; and as the Hydrophobia also, at least in some instances, appears to be of animal origin; may *it* not likewise be found a useful remedy in cases of Canine Madness?—The idea seems not altogether unworthy of attention. Hitherto we have discovered very little of the nature of this disease, or of the manner in which animal and other poisons affect the system. In this uncertainty the most improbable suggestion may have its use. The least glimpse of probable benefit from any medicine, in this case, deserves notice; and future experience may prove Ammoniac to be a valuable remedy in the numerous diseases which arise from chemical injury to the constitution.

are produced. The unexpected length of this article forbids our enlarging on this subject.

* The success of the VOLATILE ALKALI in the cure of the bite of the Viper, is a further inducement to make trial of it, in cases of the bite of the rattle-snake. The reader, who is curious for further information on this point, may consult "Dictionaire raisonné universel d'Histoire Naturelle"—par M. Valmont de Bomare, tome ix. p. 352; where, with much other valuable information, he will find a circumstantial narration of an instance of the curative effects of this salt, in destroying the poison of the Viper.

ART. III. *Medico-Chymical Dissertations on the Causes of the Epidemic called the Yellow Fever; and on the best Antimonial Preparations for the Use of Medicine.* By a Physician, Practitioner in Philadelphia. Philadelphia. *Snowdon* and *M'Corkle.* 8vo. pp. 41. 1796.

WE learn from a vote of thanks annexed to each of these Dissertations, that the author is FELIX PASCHALIS OUVIERE, Doctor of Divinity and of Physic, in Philadelphia; and from the queries prefixed to each, that they are intended as answers to Prize Questions proposed in 1794 and 1795, by the Medical Society of Connecticut. We rejoiced to find the Physicians on the one side of New-York, promoting useful inquiry at their annual sittings, and endeavouring to bring forward professional talents; and a practitioner on the other side making answers, which the querists call "ingenious," and "very ingenious and entertaining." We had little doubt, in turning over at first the leaves of the pamphlets, and finding this to be the case, we should be struck with the *ingenuity*, and pleased with the *entertainment* it afforded, in as high a degree as the Medical Society of Connecticut appear to have been. It must be owned, however, that the expectation raised by the commendations of that medical body, and their resolves of thanks, have in a good degree been disappointed on the perusal of the performances. And we cannot but regret, that Public Institutions are not more circumspect in distributing their compliments and honours.

From these general remarks, we shall, however, proceed to the separate consideration of the pieces themselves.

The Dissertation which stands first, is intended as an answer to the following prize-question: "*What are the Chymical properties of the effluvia of contagion of the epidemic of New-York, in the year 1795; what its mode of operation on the human body; and does said epidemic differ from the usual fevers of this country except in degree?*" —To which Dr. Ouviere replies, that "the chymical properties "of the effluvia, or *principles* of the epidemic of New-York, "which raged also through several towns of the United States, "are those of the abundant heat or excessive caloric of the at-"mosphere; that this caloric operates on the human body, by sa-"turating itself with all the aqueous particles of the blood, until "*it* reduces *it* to *its* putrid fermentation;" and that "the Yellow "Fever differs entirely from the bilious intermitting of this coun-"try, which is owing only to the alteration or putrefaction of the "bile:"—and so the writer informs the proposers of the question, that the chymical properties of the effluvia of the epidemic of New-York, and of other parts of North-America, are those of exces-

sive heat in the atmosphere, which saturates itself with the watery particles of the blood, and reduces it to a putrid fermentation! and that this Yellow Fever is wholly different from the Bilious Intermitting Fever of this country!

In order to come to this conclusion, Dr. Ouviere considers the distemper in New-York, during the summer and autumn of 1795, as the same which prevailed in Philadelphia in 1793. He does not dispute whether it is of foreign derivation, or of local origin at home, but thinks "such a fever is epidemical whilst its remote "or primitive cause proceeds wholly from the state of the atmos- "phere; but this cause acts as a contagion infecting the body with "all the principles of its own putrefaction." He affirms the certain prognostic to be a complete decomposition of the whole mass of blood in the course of six or seven days. To establish this latter point, he takes a three-fold view of the disease. 1. The analysis of the symptoms. 2. The accidents attending it. (What are symptoms but accidents?) And, 3dly. The appearances on dissection; and endeavours to prove therefrom the putrid decomposition of the blood in the living vessels. We are grieved to find that, at this time, there are any supporters of that deceitful hypothesis: and while we recommend to Dr. Ouviere an attentive examination of the different appearances which the blood assumes in the course of the disease, both from internal causes, and the introduction of substances ab extra, we would caution him against giving his assent to the notion of a *putrefactive fermentation* going on there; an opinion, as we believe, false in itself, leading to wrong estimates of the virtues of remedies, and consequently productive of erroneous and mischievous management in practice. The author then goes on to remark, that, being drained of its aqueous particles, the blood will be rendered unfit for the different animal functions: and that uncommon heat of the atmosphere, and many internally heating causes, will bring on such a condition of that fluid, by dissipation of its watery part, as to induce, among others, malignant, putrid, and epidemic diseases. These are produced by destroying the equilibrium, which ought to exist among the constituent elements: and after the destruction of this equilibrium of the blood by caloric, a decomposition is produced, which, according to our author, is neither more nor less than putrefaction.

Impressed with this idea, he proceeds to inquire, whether contagion or miasmata, introduced into the blood, can make it putrefy? And though he seems to allow there are facts which support the affirmative of the question, yet, upon the whole, there is not sufficient ground for the theory in the present case; he therefore rejects the introduction of effluvia into the blood, as an inadequate cause of its putrefaction.

He then examines whether the decomposition of the blood, which with him is the essence of the malady, is caused by the bile? and considers this opinion as adopted upon feeble and inconclusive evidence.

Having thus removed the impediments to his investigation, Dr. Ouviere proceeds to explore this abstruse subject in his own way. In doing this, he calls in the aid of the New Chemistry, which has been applied with so much success of late, to explain the phenomena of organized bodies, and even to elucidate some of the functions of living beings.

The author mentions the analysis and synthesis of water; but declines enumerating the component parts of the blood, or the changes they are prone to undergo from chymical attraction. To the water in the blood corrupting, as in every putrefying substance, he looks for the efficient cause of all the febrile phenomena. Water converted into steam, (or *aqueous gas*, to use the word of our author) by caloric, is the great disorganizer of animal and vegetable substances after death, and of the circulating blood before death. And by this first and only agent, either in the form of ice, water, or steam, are most phenomena during life, and after death, to be accounted for. *Aqueous gas* was the cause of the distemper in New-York, in 1795, and of all similar distempers that have visited the United States; and it operated by breaking down and removing whatever obstacles were in its way, and by its *specific levity* disengaging itself from every thing, leaving the other component atoms to form ammoniac, nitric acid, &c. according to their respective affinities. In short, putrefaction of the blood was the cause of the Yellow Fever, and *aqueous gas* was the cause of the putrefaction, and caloric was the cause of the expansion of the watery portion of the blood into aqueous gas.

It is extremely unpleasant to be obliged to review such reasoning as this. To extract a meaning from sentences obscurely composed, is at all times laborious; and to interpret words employed in the most vague and indefinite manner in every paragraph, is a perplexing task: but all this and more our patience could submit to, were we to be compensated for our pains. This part of the performance now before us, gives us indeed a deal of disagreeable work, and a very inadequate reward. We can hardly persuade ourselves to offer any further criticism upon it. Dr. Ouviere is, however, requested to consider whether *aqueous gas* can be formed (he admits the fact himself, p. 12.) under the 80th degree of Reaumur's scale? (212th of Fahrenheit's) whether the heat of human blood ever, in the hottest fever, exceeds much more than half that amount? whether experiment has not ascertained that the temperature of the vital parts is, *cæteris paribus*, nearly the same, at all seasons of the year? whether, therefore, aqueous

gas can be formed at the heat of human blood? and in the blood-vessels? from the serum? and rather in summer and autumn than at other times of the year? when the blood is equally warm or more fraught with water? It is a strange opinion of this gentleman that the blood oftentimes waxes boiling hot (80 degrees Rem. or 212 Fahren); and when such a phenomenon happens in the body, an abundant perspiration transudes from all its parts, and chiefly from the breast.

The author next proceeds to answer two objections to his hypothesis. The first is, that if aqueous gas, (boiling steam) formed in the blood was the cause of yellow fever, all persons ought to die of it; to which he thinks he has made a sufficient reply when he says, that in abundance of cases aqueous gas is formed so gradually, and the putrefaction occasioned by it operates so moderately, that there is time for art to relieve the patient before a fatal decomposition is wholly effected. The second objection is derived from the heat of the atmosphere, which might be supposed, he thinks, to produce a similar decomposition in the blood every where, especially between the tropics; and this he obviates in a manner that we confess we are unable to comprehend.

Though Dr. Ouviere is so defective in the philosophical part of his dissertation, it is but candid to pronounce that he appears to more advantage in his "Practical Cautions" and "Method of Cure." In the *former* he recommends washing, cleaning, &c. running streams of water brought into towns; vegetable diet of ripe fruits, greens and seeds; sparing use of spirituous liquors; frequent warm bathing; avoiding the exhaustion of strength by excessive heat and sweating; drinking of claret wine mixed with water; small liquid purgatives; the removing of crudities from the stomach and intestines, and, generally, attention to the peculiarities of each individual constitution. All this we believe to be good advice, and we join our recommendation to that of Dr. Ouviere, in order to encourage our fellow citizens to adopt the mode. Much benefit will undoubtedly accrue from it, both in city and country. In the *latter*, his first indication of cure is to restore to the blood, and all the animal fluids, as many watery particles as they have lost, by the caloric. This indication he fulfils by acidulous, cooling and diluting draughts, such as barley-water and gruel, chicken or veal broths, and milk whey. From the general distatse which the sick express for animal food, and for other reasons which, if it would not swell this article too much, we could easily express, we think the soups and whey may be omitted, in the beginning of the disorder especially, and ripe fruits, cold water and oxymel, and, in general, farinaceous and saccharine substances, mixed with a large proportion of water, substituted in their place. In addition to these things, he recommends

the use of the warm bath, a time or two, early in the disease, Practisers have disputed whether, if the bath were proper at all, it ought to be cold or warm: some have recommended *one*, and some the *other;* and some again *both* alternately, in quick succession. Our own opinion is, they are all useful, by removing pestilential matter from the body, as well as by procuring for it an agreeable temperature. We believe the cold bath practice has been frequently carried too far, from a misrepresentation of its mode of operation; and are inclined to think, upon the whole, the *tepid* bath may be as efficacious as any, and upon the whole, the most safe.

The second indication is to remove the morbific matter, resulting from the decomposition of the blood: and this he says ought to be efficacious and active, to prevent the rapid progress either of the inflammation or putridity. For this purpose he recommends repeated bleedings to be begun even *before* the use of the bath, and these not to be omitted even in fat and weak habits. On this controverted point of venæsection, besides the authority of Dr. Ouviere, and the practice of De Haen, Sydenham, La Montagne, Stubbs, &c. we can add our own experience of its high utility, in many cases of autumnal distempers of this country, as it has been advantageously practised in the New-York Hospital during the pestilence of 1796, at repeated times, to the amount of from 24 to 175 ounces, and in some cases several times performed after the sixth day of the disease, to the great relief of the sick. Mistaken notions about the putrid state of the blood and humours, and concerning the use and operation of what are called alexipharmic and antiseptic remedies, have induced many physicians of late to oppose this practice. But experience of the great benefit to be derived from it, is happily getting the better of these ill-founded and hypothetical prejudices. As far as we can judge of the practice of many of the most reputable writers in physic, and from our own observations, we are clear in our opinion, that though venæsection may be and has been abused, yet it is justly to be reckoned one of the most proper remedies that can be employed in the greater part of these pestilential maladies, and that a large portion of the sufferings of the sick have been endured by reason of its total omission, or too tardy and limited use.

Immediately after bleeding, our author advises strong epispastics; and it must be observed, that in cases of considerable local affections of the head, stomach, or breast, they have been productive of good effects, and ought to be applied.

He next proposes the employment of cathartics, and even of the drastic kind, to clear the alimentary canal, and to repeat these according to the exigency of the case. The calomel and jalap which

he mentions as having been frequently successful, is, however, not a new remedy. More than an hundred years ago we find, that a scruple of calomel, mixed with half a scruple of resin of jalap or scammony, had been prescribed, and, as it is related, with remarkable benefit in febrile diseases, by Professor Riverius, the famous physician of Montpellier. This was his great febrifuge, and he almost made a sort of nostrum of it. The renewal and repetition of this practice in America, coincides remarkably with the effects ascribed to it by the French practitioner.

Dr. Ouviere also observes, that antiseptic medicines have been too much used during the Yellow Fever in Philadelphia. We consider this a just remark, and are satisfied, that in numberless instances, Peruvian bark, snake-root, &c. have done more hurt than good.

On the whole, while we declare our sentiment, that the author has wholly failed in his attempt to explain the chymical properties of contagion, and its manner of operating on the constitutions of men, and is mistaken in his opinion of the Yellow Fever, *differing entirely* from the common fevers of America; we, without hesitation, do him the justice to observe, that the practical directions (which are not asked for in the Society's queries) are such, as in general are safe and well-adapted as far as they go.

THE *Second Dissertation* is a professed treatise on the Antimonial Preparations which best answer the different indications in fevers, and on the necessary modes of their exhibition: proposed by the Connecticut Society as another Prize Question. Of this it may be remarked, that it contains chiefly the common accounts of the history and preparations of Antimony, in a more imperfect form than they are to be found in most of the modern books on chemistry. The author dwells most particularly upon *tartar emetic*, and *kermes mineral*, (red sulphurated oxyd of antimony,) to the latter of which he is particularly attached, and declares it to be the best antimonial preparation that physic can employ in a great number of "diseases, and indications of fevers:" And closes the dissertation with a particular enumeration of its virtues and mode of administration. In doing this, Dr. Ouviere appears to us to shew the partiality, very commonly possessed by physicians for a favourite remedy.

MEDICAL FACTS, HINTS, AND INQUIRIES.

INOCULATION.

IT has lately become a question, in Great-Britain, whether the degree of *fever*, and quantity of *eruption*, in the inoculated small-pox, are not modified by the quantity of matter introduced into the system, by inoculation. It is the opinion of Dr. George Fordyce, that the number of pustules will be greater, and the fever more severe, when much matter is inserted, than when but little is inserted; and this opinion is countenanced by two communications, made to Dr. Beddoes, and lately published by that gentleman, at the end of his translation of Gimbernat's "New Method "of Operating for the Femoral Hernia." And since, still further supported by communications from Dr. Thornton and Mr. Field, printed in Dr. Beddoes' "Considerations on the Medicinal Use, "&c. of Factitious Airs."

I wish to call the attention of practitioners of medicine to this point. No country is under better circumstances to determine the question, than the United States; in which inoculation is almost universally practised, and where some physicians have opportunity of making several hundred observations every year.

I have always been in the practice of inserting a very small quantity of dilute matter, by a small incision; though, I confess, not from any expectation of mitigating the disease by this means.—When an incision is large, the blood is apt to wash away the matter, or the local inflammation throw it off. And if it be not fluid, it is an impediment to its ready absorption. All these inconveniencies are prevented by dilution and a small puncture. But, if a milder disease is communicated by it also, there is a more important reason for observing the practice.—Mr. Field's letter is pointed on this subject. He declares, that he has followed the practice of inoculating with matter so diluted that he cannot have used more than a "drop or two," for more than twenty years; in which time he and his pupils have inoculated upwards of *two thousand* persons, without the loss of more than *one*.*

* Mr. Field prefers the thin matter which first appears in the pustules, to that which is maturated; and diluted in the proportion of about 100 parts water, to one of matter. He never draws blood.

In all the cases which have fallen under my care, I do not remember but a single instance where the patient has had so many as thirty pustules; and this depended on circumstances no wise connected with the manner of performing the operation, and arose from causes sufficiently obvious. My patients have been of various ages, from two months to thirty years.

On the other hand, I have had occasion to observe, in numerous instances, where the incision was large, and the quantity of matter inserted considerable,—especially when the *thread* was used,—that the patients either had very sore arms, or great numbers of pustules; and oftentimes with several days of severe pain and fever. I do not pretend that this uniformly happens. Constitution, treatment, and accident, may, and must, produce variety. But still it seems highly interesting to determine how far their influence extends; and whether any, and what, effect is to be attributed to the greater or lesser quantity of variolous matter, introduced into the system, by inoculation.

Communications are requested, from all parts of the United States, and elsewhere, on this subject.

CARBON.

DR. PEARSON, (p. 159, Beddoes' Considerations, &c. on Factitious Airs. P. iii.) speaking of the internal exhibition of *yeast*, seems to suppose that its having in one instance caused vomiting and in another purging, is to be ascribed to the *bitter principle of the hop*. Dr. Thornton (p. 160.) controverts this Doctrine, and considers eructations as the evidence of the operation of the medicine. Perhaps the following remarks may throw some light on the question:—

Simple carbon, or charcoal deprived of its oxygen by heat, has been administered, in the New-York Hospital, in perhaps 15 or 20 cases. In no instance, as far as I can remember, has it failed to purge; and in several, the purging and intestinal commotion excited by it have been so great, that we have been obliged to discontinue it.—Combined, however, with carbonate of soda *(sal sodæ,)* and particularly with the addition of lenitive electuary, it has proved, in my hands, one of the gentlest and most efficacious remedies for the removal of habitual costiveness, I have ever known. I have thought, too, that this combination has had other and more salutary effects, in a few cases of Scrofula and Consumption, in which I have administered it. But further and more nice observations are necessary to determine the point.

The following formula is that which I have used:

Take of Lenitive Electuary,	℥ iv	Mix.
Carbonate of Soda,	ʒ ii	
Carbon,	ʒ ii	

Of this from ʒ ss to ʒ i and ʒ ii, to be taken twice, thrice, or more times in the day, according to circumstances.

SIPHILIS.

JOHN CLARKE was admitted into the New-York Hospital, Sept. 7, 1796. Six weeks before this date he was seized with venereal *running and scalding*. After the appearance of the Gonorrhœa, he had intercourse with other women; and in a fortnight from its breaking out, he had a *Chancre* come on the outside of the prepuce; the Glans being naturally hooded. About a week after the chancre made its appearance, a bubo formed in the left groin; which opened of itself, yesterday; and now discharges freely.

A case of Gonorrhœa and Siphilis, equally distinct, and with equal probability of having originated from separate infection, fell under Dr. Rodgers's care the ensuing autumn or winter.

Do these facts go any way towards the confirmation of Mr. Bell's doctrine, that Gonorrhœa and Siphilis are different diseases?

SIPHILIS AND FEVER.

IN the summer of 1796, a man came into the New-York Hospital in a state of salivation. On inquiry, we discovered that he had the venereal disease—chancres, or buboes, or both—for which he had taken mercury, so as to produce the salivation; which was of some standing. But, beside that he had siphilis and was salivated, he had an *Intermitting Fever*, of some standing also, and which was more than commonly obstinate. He got well, by the use of the ordinary remedies; but not till he had one or two relapses of the fever.

Remark. It is nothing new for an Intermittent to proceed, notwithstanding a salivation, and even to arise during it—(see HOFFMAN *de bile Medicin, &c.* § 29. and Van Sweiten's Comment. on Aphorism, 757.) but that it should exist at the same time, and for several weeks, with Siphilis, has, I believe, never been publicly noticed till now.

Quere. Does this fact form any objection to Mr. Hunter's theory of the impossibility of different contagions displaying their effects, co-ordinately, in the same person? Or, are we to infer from this that the contagion of fever and siphilis are the same? The nitric acid, according to Mr. Scott and others, cures hepatic swellings; and these are often the consequences of intermittents. It also cures siphilis. Should future trials demonstrate this acid to be equally successful in the cure of intermittent, remittent, and yellow fevers, would it be fair to conclude that the immediate cause of these fevers and of siphilis are but modifications of one common principle?

E. H. S.

☞ *In the following Meteorological Tables some explanation may perhaps be necessary. The figures, in the columns of clear and cloudy, denote the times of observation. Thus, when the figure* 1 *occurs in the first of these columns, and in the second likewise, it signifies that the sky was clear at the first, and cloudy at the second, observation. When the figure* 2 *occurs in either column, it signifies that the sky was clear, or cloudy, at both times of observation.*

The Thermometrical Observations are made on Fahrenheit's Thermometer.

METEOROLOGICAL OBSERVATIONS *for January*, 1797, *made by* GARDINER BAKER, *in the Cupola of the Exchange in the City of* New-York.

Days of the Mon.	Thermometer observed at 7 A. M.	Thermometer observed at 3 P. M.	Prevailing winds. 7 M.	Prevailing winds. 3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	Barometer observed at 3 P. M.
1	27	33	W	W	2		29 80	29 88
2	23	28	N W	W	2		29 97	30 7
3	22	26	N E	N E		2	30	29 80
4	19 50	30	N W	S W	1	1	29 78	29 67
5	23 50	28 50	W	W	2		29 60	29 67
6	27 75	39 25	S W	W	2		29 52	29 43
7	17	22 50	N	W	1	1	29 85	29 90
8	3 50	15	N	N E	2		30 20	30 30
9	0	16	N	N	2		30 47	30 50
10	3 50	24 25	N W	S W	2	w.fro	30 47	30 32
11	23	36	E	S E		2	30 15	29 84
12	32 50	38	W	W	2		29 68	29 78
13	31	40 50	N W	W	2		30 10	30 14
14	30	33 25	S W	N E		2	29 98	29 70
15	33 75	41	N W	W	2		29 70	29 75
16	32	41	S W	N W	2		29 45	29 47
17	26	31	N W	N W	2		29 94	29 99
18	23 50	32	S E	S		2	29 95	29 79
19	27	28	N W	N	2		30 6	30 25
20	18 50	28	N E	N E		2	30 30	30 23
21	24	28	N E	N E		2	30 21	30 16
22	23	29	N E	N W		2	30	29 95
23	27 50	37	S W	S W	2		29 99	29 80
24	26	41	W	W	2		29 74	29 85
25	20	27	N W	S E	2		30 5	30 19
26	28	42	S	S	1	1	30 15	29 97
27	36	45 50	S W	S W	2		29 95	29 80
28	39	46	S W	S W	1	1	29 55	29 58
29	36	44	E	E	1	1	29 50	29 23
30	27	35 50	N W	W	2		29 65	29 85
31	24 50	30	E	E		2	30 13	30 50

Results of Meteorological Observations for January, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 24 35 hund.
Do. do. of the do. at 3 P. M. 32 78
Do. do. of the do. for the whole month, 28 56
Greatest monthly range, between the 9th and 28th, 46
Do. do. in 24 hours, on the 10th, 20 75
Six days it snowed, and about 8½ inches have fallen.
Five days it rained, and a large quantity has fallen.
Coldest day, the 9th. Warmest day, the 28th.

METEOROLOGICAL OBSERVATIONS *for February*, 1797.

Days of the Mon.	Thermometer observed at 7 A. M.	Thermometer observed at 3 P. M.	Prevailing winds. 7 M.	Prevailing winds. 3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	Barometer observed at 3 P. M.
1	30	30	E	E		2	30 6	30 4
2	37	49	W	W	1	1	29 53	29 60
3	32	44	W	W	2		30	29 95
4	31	40	W	W	2		29 95	29 95
5	31	42	S	S E	2		30 7	30
6	40 50	50 50	S W	S W		2	29 71	29 46
7	34	36	W	N W	2		29 70	29 80
8	26	38	W	W	2		30 1	30 18
9	31 50	42	S	S E	2		30 5	30 3
10	44	48	S E	S E		2	29 69	29 48
11	40	44 50	N	N W		2	29 41	29 55
12	31	53 25	W	W	2		29 61	29 72
13	36	38	N E	E		2	29 90	29 80
14	35	36	N E	N E		2	29 60	29 46
15	27	30	N E	N W		2	29 68	29 78
16	25	33	N W	N W	2		30 18	30 20
17	25	39	E	S		2	30 24	29 95
18	36	41	N W	N W		2	29 70	29 72
19	31	46	calm	S W	2		29 97	29 85
20	38	50	S W	S W	1	1	29 57	29 43
21	23	32	N E	S	2		29 89	29 91
22	34	52	E	W	1	1	29 38	29 26
23	32	42	E	S E	2		29 81	29 81
24	50	57	N W	N W		2	29 38	29 50
25	33	35	S W	W	2		29 65	29 53
26	16	23	N W	W	2		29 79	29 90
27	38	47	S	S W		2	29 84	29 73
28	34	35	N W	W		2	29 73	29 73

Results of Meteorological Observations for February, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 32 9 hund.
Do. do. of the do. at 3 P. M. 41 2
Do. do. of the do. for the whole month, 36 55
Greatest monthly range, between the 24th and 26th, 41 0
Do. do. in 24 hours, between the 26th and 27th, 22 0
One day it snowed, and 2½ inches have fallen.
Seven days it rained, and a large quantity has fallen.
Coldest day, the 26th. Warmest day, the 24th.
On the 26th a remarkable appearance of the Aurora Borealis in the evening, at the north point. Its appearance changed several times, and at length collected in a pyramidical form and disappeared.

METEOROLOGICAL OBSERVATIONS *for March*, 1797.

Days of the Mon.	Thermometer observed at 7 A. M.	Thermometer observed at 3 P. M.	Prevailing winds. 7 M.	Prevailing winds. 3 E.	Clear.	Cloudy	Barometer observed at 7 A. M.	Barometer observed at 3 P. M.
1	22	35	NW	NW	2		29 97	30 1
2	24	37	NE	SE	1	1	30 17	30 14
3	33	42	NE	SW		2	29 85	29 89
4	38	49 50	S	W	1	1	29 67	29 56
5	50 50	54	W	W	1	1	29 20	29 24
6	22	25	NW	NW	2		29 69	29 81
7	19	28	NW	SW	1	1	30 1	29 90
8	37	60	SW	SW	1	1	29 30	29 4
9	25	30	NW	NW	2		29 80	29 89
10	19	32	NW	NW	2		30 20	30 24
11	28	33	S	E		2	30 16	29 98
12	28	36	S	S	1	1	30 10	30 17
13	36	43				2	30 9	30
14	45	62	S	S	1	1	29 80	29 73
15	36	44	NE	NE		2	30	30 9
16	33	36	E	NE		2	30 27	30 17
17	38	48	E	E		2	29 90	29 67
18	48	62	SW	W	1	1	29 51	29 31
19	41	46	W	W	1	1	29 47	29 52
20	30	44	NW	NW	2		29 77	29 78
21	30	51	W	S	2		29 88	29 84
22	42	45	SE	E		2	29 70	29 32
23	39	56	NW	NW	2		29 42	29 70
24	42	46	SE	SE	1	1	29 90	29 74
25	47	52	W	NW	2		29 55	29 75
26	32	40	E	S	2		30 9	30 9
27	47	55	S	NW	1	1	29 40	29 23
28	34	37	NW	NW	1	1	29 59	29 70
29	30	45	calm		2		30	30 1
30	34	43	E	SE	1	1	30 2	30
31	40	43	SE	S		2	29 78	29 55

Results of Meteorological Observations for March, 1797.

Mean temperature of the Thermometer at sun-rise,	deg.	34 50 hund.
Do. do. of the do. at 3 P. M.		43 85
Do. do. for the whole month,		39 75
Greatest monthly range, between the 7th and 18th,		43 0
Do. do. in 24 hours, between the 8th and 9th,		35 0

Three days it snowed, and about eight inches have fallen.
Nine days it rained, and a very large quantity has fallen.
Coldest day, the 7th. Warmest day, the 18th.
Two thunders and lightnings, one of which was heavy.
A number of remarkable heavy winds have occurred this month.

METEOROLOGICAL OBSERVATIONS *for April*, 1797.

Days of the Mon.	Thermometer observed at Sun-rise.	3 P. M.	Prevailing winds. S.r.	3 E.	Clear.	Cloudy	Barometer observed at Sun-rise.	3 P. M.
1	43	49	N W	N W	1	1	29 50	29 50
2	40	48	S W	S E	2		29 70	29 50
3	46	70	S	S	2		29 65	29 75
4	46	60	E	S	1	1	29 84	29 70
5	54	82	S W	S W	2		29 69	29 60
6	56	56	N	E		2	29 61	29 61
7	44	42	N E	E		2	29 68	29 60
8	39	40	E	E		2	29 45	29 30
9	42	54	N W	N W	2		29 34	29 98
10	36	48	N W	N W	2		29 70	29 72
11	38	56	W	W	2		29 75	29 62
12	44	48	N W	S E	1	1	29 65	29 65
13	41	38	E	E		2	29 55	29 40
14	35	58	N	W	2		29 50	29 60
15	47	58	S W	S	1	1	29 62	29 60
16	45	44	E	E		2	29 60	29 61
17	37	49	N E	S E	2		29 69	29 60
18	37	38	E	N		2	29 30	29 4
19	37	45	N	N		2	28 97	29 30
20	41	50	N W	N W		2	29 50	29 55
21	43	55	S W	S W	1	1	29 72	29 67
22	44	58	S	S	2		29 70	29 70
23	46	48	S E	E		2	29 70	29 72
24	44	49	E	E		2	29 78	29 68
25	48	60	S	S	1	1	29 39	29 37
26	49	63	S W	S W	2		29 49	29 49
27	42	56	N E	S E	2		29 76	29 83
28	44	61	E	S	2		29 85	29 80
29	50	71	E	E	2		29 75	29 74
30	52	59	E	N E		2	29 80	29 75

Results of Meteorological Observations for April, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 43 6 hund.
Do. do. of the do. at 3 P. M. 53 7
Do. do. for the whole month, 48 65
Greateſt monthly range, between the 5th and 14th, 47
Do. do. in 24 hours, on the 5th, 28
Twelve days it rained, and an uncommon quantity has fallen.
One day it ſnowed, and about ſix inches have fallen.
Coldeſt day, the 14th. Warmeſt day, the 5th.
Three times it thundered and lightned, and there was conſiderable.

METEOROLOGICAL OBSERVATIONS *for May*, 1797.

Days of the Mon.	Thermometer observed at		Prevailing winds.		Clear.	Cloudy	Barometer observed at	
	Sun-rise.	3 P. M.	S.r.	3 E.			Sun-rise.	3 P. M.
1	56	70	S	S	1	1	29 55	29 52
2	51	58	E	E		2	29 55	29 70
3	42	47	N W	S E		2	29 70	29 80
4	50	68	S W	N W	1	1	29 53	29 55
5	50	51	S E	S E	1	1	29 45	29 41
6	51	68	N W	S W	2		29 24	29 75
7	55	59	W	W	2		29 15	29 17
8	42	57	W	W	2		29 38	29 40
9	44	55	N W	N W	1	1	29 59	29 39
10	50	70	S	S W	1	1	29 77	29 70
11	55	75	S W	S	2		29 78	29 72
12	55	64	S E	E		2	29 62	29 41
13	56	69	W	S W	2		29 40	29 44
14	46	55	N W	S W	1	1	29 70	29 73
15	47	59	S	S	2		29 65	29 60
16	50	57	N	S E		2	29 65	29 64
17	48	62	N W	S	2		29 81	29 81
18	53	67	S	S		2	29 69	29 59
19	51	65	N	S	2		29 75	29 80
20	51	55	E	S E		2	29 80	29 64
21	57	70	S E	S E	1	1	29 49	29 31
22	60	72	N W	W	2		29 50	29 53
23	56	65	S E	S E	2		29 39	29 44
24	54	66	E	E	1	1	29 40	29 41
25	54	69	E	E	1	1	29 36	29 38
26	55	71	N	S	2		29 59	29 65
27	55	62	E	S E	1	1	29 73	29 65
28	60	68	S W	N W	1	1	29 50	29 52
29	55	71	W	S W	2		29 68	29 68
30	55	52	E	N E		2	29 70	29 65
31	52	66	N	N W	1	1	29 59	29 61

Results of Meteorological Observations for May, 1797.

Mean temperature of the Thermometer at sun-rise,	deg.	52 13 hund.
Do. do. of the do. at 3 P. M.		63 3
Do. do. for the whole month,		57 58
Greateſt monthly range, between the 3d and 11th,		33
Do. do. in 24 hours, between the 10th and 11th,		20

Thirteen days it rained, and a very large quantity has fallen.
Six days it thundered and lightned, and in great abundance.
Coldeſt day, the 3th. Warmeſt day, the 11th.

METEOROLOGICAL OBSERVATIONS *for June, 1797.*

Days of the Mon.	Thermometer observed at Sun-rise.	3 P. M.	Prevailing winds. S. R.	3 P.	Clear.	Cloudy	Barometer observed at Sun-rise.	3 P. M.
1	50	69	N W	W	2		29 80	29 76
2	50	62	N W	S E	1	1	29 76	29 67
3	59	76	S	S	1	1	29 61	29 71
4	50	61	S E	S E		2	29 70	29 55
5	63	73	W	N W	2		29 32	29 44
6	55	71	S	S	2		29 66	29 60
7	63	78	W	S W	2		29 61	29 70
8	59	72	E	S E	2		29 85	29 90
9	64	78	E	E	1	1	29 90	29 83
10	64	74	S	S E	1	1	29 70	29 57
11	66	80	N W	N W	2		29 65	29 66
12	64	81	W	S W	2		29 70	29 65
13	70	76	S W	S E		2	29 65	29 46
14	64	78	N W	N W	2		29 56	29 64
15	66	85	S W	W	2		29 63	29 74
16	60	77	E	E		2	29 60	29 54
17	66	77	W	N	2		29 54	29 56
18	62	77	E	N E		2	29 57	29 30
19	54	69	N	W	1	1	29 64	29 73
20	57	69	E	S	2		29 85	29 85
21	58	70	E	S E	1	1	29 88	29 91
22	60	66	E	S E		2	29 84	29 68
23	60	64	S E	N E		2	29 44	29 44
24	63	71	W	S		2	29 45	29 50
25	66	82	N W	N W	2		29 72	29 75
26	66	82	N W	W	2		29 86	29 86
27	66	81	S	S	2		29 90	29 93
28	65	79	S W	S W	1	1	29 91	29 90
29	66	84	S W	S	2		29 83	29 80
30	68	89	S W	S W	2		29 79	29 79

Results of Meteorological Observations for June, 1797.

	deg.	4 hund.
Mean temperature of the Thermometer at sun-rise,	61	4 hund.
Do. do. of the do. at 3 P. M.	75	1
Do do. for the whole month,	68	2
Greatest monthly range, between the 1st and 30th,	39	
Do. do. in 24 hours, on the 30th,	21	

Nine days it rained, and a very large quantity has fallen.
Seven days it thundered and lightned, and in great abundance.
Coldest day, the 1st. Warmest day, the 30th.

A TABLE *of Patients admitted into the New-York Hospital, from the 1st of January, 1797, to the 1st of July, 1797; shewing the disease for which each was received, with the event of the case.—N. B. This Table will be continued in the future numbers of the Repository; and hereafter it is the design of the Editors to render it more ample, and in all respects more correct.*

MEDICAL *Patients received in January.*

DISEASES.	No	Cured.	Relieved.	Died.	Remain under Care.	Result.		
Pneumony	8	8						
Fever	3	3				Received		58
Pulmonary Consumption	2		1	1				
Gonorrhœa	2	2				Cured	52	
Syphilis	10	10				Relieved	2	
Rheumatism	11	11				Died	3	
Natural Small-pox	1			1		Remains	1	
Ischuria	1	1						
Diarrhœa	1	1						58
SURGICAL.								
Film on the Eye	1	1						
Tumor	1	1						
Frozen Limbs	10	8		1	1			
Ulcer of the Leg	3	2	1					
Wound in the Thigh	1	1						
Wound of the Leg	1	1						
Wound of the Side	1	1						
Fractured Arm	1	1						
February. MEDICAL.								
Pneumony	4	2		2		Received		27
Anarsarca	4	2		2				
Syphilis	4	4				Cured	20	
Fever	4	3		1		Relieved	1	
Herpes	1	1				Died	5	
Hæmoptysis	1	1				Remains	1	
Diseased Hip Joint	1				1			27
SURGICAL.								
Ulcer of the Leg	4	4						
Laceration	1	1						
Frozen Limbs	2	1	1					
Burn	1	1						

March.	N	Cure.	Relev.	Dead.	Remain.	Discha. Milford. or elop.	Result.	
MEDICAL.								
Syphilis	10	10					Received	25
Fever	1	1						
Rheumatism	4	3				1		
Amenorrhea	1	1					Cured 24	
Pneumony	3	3					Disorderly 1	
SURGICAL.								25
Fractured Arm	2	2						
Ulcer of the Leg	2	2						
Wounded Hip	1	1						
Dislocation	1	1						
April.								
MEDICAL.								
Scrofula	1	1					Received	40
Cancer	1			1				
Colic	1			1			Cured 29	
Rheumatism	4	4					Relieved 1	
Syphilis	16	16					Dead 4	
Pneumony	5	4		1			Eloped 2	
Amenorrhea	1					1	Remain 4	
Opthalmia	1				1			40
Palsy	1				1			
Fever	2	2						
Enteritis	1			1				
SURGICAL.								
Tinea	1	1						
Scrofula	1				1			
Luxation	1	1						
Fracture	2		1			1		
Lumbar Abscess	1				1			
May.								
MEDICAL.								
Pulmonary Consumption	1		1					
Pneumony	4	2		1	*1			
Syphilis	7	7						
Rheumatism	3	1			2			
Fever	3	2		1				
Dropsy	2	2						
Mania	2		1	1				

* As this patient was nearly well, he was seized with Rheumatic pains; and as they were removed, with Intermittent Fever, which preceded the eruption of the natural Small-pox. He is now recovering from a Fever which followed the Small-pox.

SURGICAL.

DISEASES.	No	Cured.	Relev.	Dead.	Remain under Care.
Sore Legs	3	3			
Fistula	1	1			
Swelled Testicles	1	1			
Apoplexy	1			1	

Result.		
Received		28
Cured	19	
Relieved	2	
Dead	4	
Remain	3	
		28

June. MEDICAL.

DISEASES.	No	Cured.	Relev.	Dead.	Remain under Care.
Dropsy	1				1
Mania	7	2	2		3
Syphilis	9	3			6
Pulmonary Consumption	2			1	1
Rheumatism	3				3
Dyspepsia	1	1			
Fever	5	2			3

Result.		
Received		31
Cured	8	
Relieved	2	
Dead	1	
Remain	20	
		31

SURGICAL.

DISEASES.	No	Cured.	Relev.	Dead.	Remain under Care.
Sore Legs	3				3

SUMMARY.

Patients received into the New-York Hospital from the first of January to the first of July, 1797, exclusive of those then remaining under care, . . . 209

Of this number have been *cured*, ...	152
relieved, ...	8
have *died*, ...	17
eloped, ...	3
Remain under *care*, ...	29
	209

A RETURN *of Patients admitted to the Care of the New-York City Dispensary, from the first of January to the first of July*, 1797.

JANUARY.

DISEASES.	No.	Cured.	Relieved.	Dead.	Removed to the Hospital.
Wounds	2	2			
Rheumatism	2	2			
Herpes	1	1			
Worms	2	2			
Fracture	1	1			
Cancer of the Uterus	1				1
Luxation	1	1			
Pulmonary Consumption	2			1	1
Hectic Fever	2	2			
Hooping-cough	1	1			
Dropsy	1			1	
Pneumony	5	5			
Menorrhagia	1	1			
Vomica	1	1			
Convulsions	1			1	
Epilepsy	1		1		
Sore Legs	2	2			
Head-ach	2	2			
Ascites	1				1
Syphilis	1	1			

Received	31
Cured	24
Relieved	1
Dead	3
Removed to the Hospital	3
	31

FEBRUARY.

Sore Legs	3		3		
Rheumatism	2	2			
Pneumony	3	3			
Palsy	1		1		
Hooping-cough	2	2			
Dyspepsia	3	3			
Fracture	1	1			
Quotidian Fever	1	1			
Erisipelas	1	1			
Burns	2	2			
Luxation	1	1			
Syphilis	2	2			
Ophthalmia	1	1			
Pulmonary Consumption	2			2	
Hectic Fever	1	1			
Scrofula	1	1			
Natural Small-pox	6	6			
Diarrhœa	2	2			
Head-ach	1	1			
Worms	1	1			

Received	37
Cured	31
Relieved	4
Dead	2
	37

MARCH.

DISEASES.	No	Cured.	Under care.	Dead.	Removed to the Hospital.	Result.	
Diarrhœa	1				1	Received	35
Pneumony	5	5					—
Rheumatism	2	2				Cured	29
Hysteria	1	1				Dead	1
Syphilis	3	3				Removed	
Natural Small-pox	11	11				to the	
Wounds	2	2				Hospital	2
Abortion	1	1				Removed	
Luxation	1	1				to the	
Intermitting Fever	1				Count.	Country	1
Remitting Fever	1	1					—
Abscess	1	1					33
Pulmonary Consumption	1			1			
Herpes	1	1					
Anasarca	1				1		

APRIL.

Pneumony	6	6				Received	40
Ulcers	3	3					—
Diarrhœa	5	5				Cured	36
Pleurodynia	1	1				Dead	2
Incipient Consumption	2	1			1	Removed	
Luxation	1	1				to the	
Rheumatism	3	3				Hospital	1
Cough	2	2				Under care	1
Catarrh	3	3					—
Syphilis	2	2					40
Scrofula	1	1					
Diabetes	1	1					
Dropsy	2	2					
Pulmonary Consumption	1			1			
Inflammation of Bowels	1	1					
Dyspepsia	3	3					
Abscess	1		1				
Wound	1	1					
Convulsions	1			1			

MAY.

DISEASES.	No	Cured.	Relieved.	Dead.	Remain under Care.	Result.	
Natural Small-pox	12	12				Received	46
Dyspepsia	1	1					—
Croup	1	1				Cured	41
Scrofula	1		1			Relieved	1
Herpes	1	1				Dead	1
Ulcer	1	1				Eloped	1
Pneumony	5	5				Removed	
Luxation	3	3				to the	
Cough	3	3				Hospital	1
Rheumatism	1				(R.C.)	Removed	
Syphilis	4	3				to the	
Intermittent Fever	6	6				Country	1
Remittent Fever	2	2					—
Pleurodynia	1	1					46
Anasarca	2			1	(R.H.)		
Head-ach	1	1					
Phrenitis	1	1					

JUNE.

Head-ach	2	1	1			Received	42
Remitting Fever	3	3					—
Cough	1	1				Cured	36
Menorrhagia	1	1				Relieved	1
Epilepsy	1	1				Eloped	1
Wound	1				(Elop.)	Under care	4
Abscess	1	1					—
Natural Small-pox	11	11					42
Herpes	2	1			1		
Sore Leg	1	1					
Pleurodynia	1	1					
Anasarca	1	1					
Worms	3	3					
Pneumony	3	3					
Hectic Fever	1				1		
Rheumatism	2	2					
Diarrhœa	1				1		
Pulmonary Consumption	1				1		
Burns	2	2					
Parturition	1	1					
Contusion	1	1					
Gonorrhœa	1	1					

SUMMARY.

Whole number of Patients admitted into the New-York City Dispensary from the first of January to the first of July, 1797, 229

Of this number have been *cured*,	197	
relieved,	7	
have *died*,	9	
eloped,	2	
Removed to the Hospital,	7	
Country,	2	
Remain under care,	5	
		229

HUGH M'LEAN.

MEDICAL NEWS.

[☞ *This title is meant to include intelligence concerning Medicine, Natural History, Agriculture, &c. &c. both Foreign and Domestic. The difficulties which beset every undertaking of the nature of the Medical Repository, at its commencement, will, we hope, be deemed a sufficient apology for any imperfections which may be discovered in the present article. Every information, tending to render this part of our publication more complete in future, is respectfully solicited, and will be thankfully received.*]

DOMESTIC.

AT a meeting of the AMERICAN ACADEMY OF ARTS AND SCIENCES, (Massachusetts) the following officers were elected for the ensuing year, viz.

JOHN ADAMS, LL. D. (President of the U. S.) *President.*
JOSEPH WILLARD, D. D. *Vice-President.*

Hon. ROBERT T. PAINE, FRANCIS DANA, BENJAMIN LINCOLN, JOHN LOWELL, Esqrs. JOHN LATHROP, D. D. JOHN WARREN, M. D. JOHN CLARK, D. D. CALEB GARNET, Esq. Hon. COTTON TUFTS, and Mr. PROFESSOR WEBBER, *Counsellors.*

BENJAMIN DEARBORN, *Recording Secretary.*
Mr. PROFESSOR PEARSON, *Corresponding Secretary.*
THOMAS WELSH, M. D. *Treasurer.*
JOHN LATHROP, D. D. *Librarian and Cabinet-Keeper.*
Rev. JAMES FREEMAN, *Vice-Treasurer.*

The following gentlemen have lately been elected members of the Academy, viz.

Christopher Gore, Esq. of Waltham.
Sir John Sinclair, Bart. (President of the British Board of Agriculture.)
Dr. John Haliburton, of Halifax, (N. S.)
Edward Bancroft, M. D. F. R. S. of London.
Timothy Dwight, D. D. President of Yale College.
Samuel L. Mitchill, M. D. &c. of New-York.

DONATIONS to the *Academy.*

The Works of Francis Bacon, Baron of Verulam, 4 vols. folio. Presented by Dr. Isaac Rand.

Observations on the Increase of Infidelity, by Joseph Priestley, L L. D. F. R. S. Presented by the President of the Academy.

Agricultural Inquiries on Plaister of Paris, by Richard Peters. Presented by the same.

Communications to the Academy.

Variation of the Magnetic Needle, from January 24, to May 22, 1797. By Mr. Stephen Sewall.

Medical Observations on the Bilious Remittent Fever of 1796. By John Warren, M. D.*

Astronomical Observations respecting the extent of the Solar System, and distance of the Fixed Stars. By the Hon. Judge Winthrop.

A proposition for making Salt-petre from Pot-ash. By Joseph Greenleaf, Esq. [*Columbian Centinel, June* 21, 1797.

The *Second Part* of the *Second Volume* of the TRANSACTIONS of the American Academy of Arts and Sciences, is said to be in a state of forwardness for publication.

Dr. Barker of Portland, in the District of Maine, is preparing a work for the press, on Consumption and Fever. In this work the Dr. expects to establish the efficacy of Alkalies, in the cure of Yellow Fever.

At an adjourned Meeting of the President and Fellows of the MEDICAL SOCIETY *of the State of Connecticut, held at Hartford, on the second Tuesday of May*, 1797, *at the house of* JOHN LEE;

VOTED, That in future there shall be appointed annually by the CONVENTION, one General Committee, for examination of Candidates for the practice of physic and surgery,—which Committee shall consist of five members, three of whom to be a quorum, vested with full powers to examine such Candidates as may be recommended to them for examination, from any of the County Committees, or any others:—And that the general committee, and they only, shall be vested with power to countersign and deliver to such candidates as they shall approve of, a licence from under the seal of the Society; and that every candidate so receiving a licence, shall pay the sum of ten dollars to said committee, which shall be paid over by them to the Treasurer of the Society; and also pay the committee a reasonable reward for their examination.—And that the several county committees shall be empowered only to examine and recommend to the general committee, such candidates as they may think proper—any former by-laws, usage, or custom, not comporting herewith, notwithstanding.

* See the Appendix.

Voted, That Doctors John Osborn, Eliakim Fish, Lemuel Hopkins, Mason Fitch Cogswell, and Daniel Sheldon, be the examining committee.

Voted, That the thanks of this convention be given to Doctor James Potter, for his oration delivered this day.

Voted, That Doctor Felix Pascalis Ouviere, M. D. of the city of Philadelphia, be a corresponding member of this society.

Voted, That the degree of Doctor of Medicine be conferred on Doctor Thaddeus Betts, of Norwalk.

Voted, That application be made to the General Assembly, for additions to the act incorporating the Connecticut Medical Society.

Voted, That Doctor Mason F. Cogswell be an agent to transact the business before the Assembly.

Voted, That whereas a committee appointed by the Medical Convention, convened at New-Haven in October last, were only to examine a manuscript of Doctor Samuel Stearns, called the *American Dispensatory*, and report thereon to the next convention:—But they having but partially examined it, did, by the repeated importunities of said Stearns, give him a certificate, approbating the same:—The convention not having received the report of their committee till this day, do *not undertake to recommend the aforesaid dispensatory to the public.*

Whereas Dr. Elisha Perkins, a member of this society, having obtained a patent from under the authority of the United States, for the exclusive privilege of using and vending certain *pointed Metalic Instruments*, pretending that they were an invention of his own; and also, that they possess inherent powers of curing many diseases, which is contrary to rules and regulations adopted by this society, interdicting their members the use of nostrums,—Therefore, *Voted*, That the said Elisha Perkins be expelled from the Medical Society of the State of Connecticut.

Voted, That a tax of one dollar be laid on each member of the society, to be collected before the next Convention.

Voted, That the clerks of the several County Meetings be collectors of the above tax.

Voted, That this meeting be adjourned until the first Tuesday after the second Thursday in October next—then to convene at the Coffee-House in New-Haven.

Test. DANIEL SHELDON, *Secretary.*

[*Connecticut Courant*, *June* 5, 1797.

The Agricultural Society of Connecticut are forming a collection of facts for publication, on the use of Gypsum, or Plaister of Paris, as a manure.

On the 8th of May, at the White-Plains, there was a meeting of respectable physicians of the county of Westchester, who formed themselves into a society to be known and called by the name and stile of "*The Medical Society of the County of Westchester.*" Dr. Archibald M'Donald was elected President, and Dr. Matson Smith, of New-Rochelle, Secretary. The principal views of their formation appear to be an harmonious establishment of a regular practice of physic throughout the county, and an immediate compliance with the law of the Legislature of the State made at the last session. [*New-York Mag.*

A spring has been discovered in Clinton county, state of New-York, containing very large quantities of a saline substance, supposed, from some slight trials, to consist chiefly of Sulphate of Magnesia, (Epsom's salts.) We are promised a more particular account of it shortly.

At the Medical Commencement of New-York, on the first Wednesday in May, the degree of Doctor of Physic was conferred on William Bay, and Alexander Hosack, jun.—The Inaugural Dissertations were, *on Dysentery*, by Mr. Bay; *on the Yellow Fever of* 1795, by Mr. Hosack.

At a meeting of the Society instituted for the Promotion of Agriculture, Arts and Manufactures in the state of New-York, on Thurday, January 4, 1797, the annual choice of officers for the current year was made, when the following gentlemen were elected:—

Robert R. Livingston, Esq. President.
Ezra L'Hommedieu, Esq. Vice-President.
Samuel Jones, Esq. Treasurer.
Samuel L. Mitchill, Esq. } Secretaries.
Samuel Jones, jun. Esq. }

It must be pleasing to all friends of their country to be informed, that during the conflict of opposite opinions in politics, this Institution, which embraces wider objects of benevolence than any political party whatsoever, is in friendly communication with both English and French Institutions of a similar nature. During the meetings of the present sessions, the Corporation has been favoured with correspondence from their friends in England and Scotland, France, and its distant territories in America. The Society is desirous of cultivating harmony and friendly intercourse with all persons and associations conversant in agricultural, œconomical, and handicraft matters, in every country. In particular, the members feel themselves interested in their correspondence with the merchants of Glasgow, and the Board of Agriculture of

London, the Superintendant of the National Botanical Garden of Paris, and the Society of Arts and Sciences in St. Domingo.

That illustrious character, who, after liberating his country from bondage, has guided it since the revolution to a very elevated pitch of happiness and grandeur, the President of the United States, the wise and virtuous WASHINGTON, has expressed himself with so much warmth and force, in his farewell address to the people of the United States, in favour of Agricultural Associations, that it cannot be doubted, that in every State wherein individuals combine their efforts for the promotion of husbandry and rural œconomics, the Legislature will aid their efforts, and grant their encouragement and protection. [*New-York Mag.*

Late in March was landed in New-York, from on board the ship Nancy, Captain Johnson, a fine Barbary *sheep*, being a present from Captain George Dekay, to Chancellor Livingston, President of the Society for the Promotion of Agriculture, &c. The *ewe* died at sea. But Mr. Dekay writes, that he has taken measures to procure two others. This sheep has a thick and fine fleece.

By the same vessel, and from the same patriotic gentleman, have been received samples of wheat from Algiers and Saffe, which the President of the Agricultural Society proposes to distribute so as to insure experiments of its utility.

Last year several seeds of different kinds were forwarded by Captain Dekay, from India, to the Agricultural Society, and, among others, a species of *flax*, which, upon experiment, made by the President and several members, appears to be well adapted to this country. It is an acquisition, considered only as an ornamental plant, and more so as a useful one; the staple of this flax being greatly superior to that in common use.

It is pleasing to acknowledge, in a gentleman, deeply engaged in business, so sedulous an attention to the agricultural interest of his country; and it is much to be lamented, that though the Society for the Promotion of Agriculture have addressed printed instructions on this head to the Captains of vessels sailing from New-York, which have been seconded by the recommendation of the Chamber of Commerce, yet agriculture has hitherto received little of that aid from them which they might, without expence or trouble, afford.

To Mr. Dorhman and Mr. Neilson, the public are also indebted for the introduction of sheep from Holland and Ireland. [*Ib.*

The Agricultural Society of New-York, have directed their Committee of Publication, to prepare a *third part* of the *first volume* for the press.

Thermometrical Observations at Poughkeepsie.

1797. Jan. 4	7 o'clock A. M. the Thermometer stood at	11	below	0
8.	do. do.	11	do.	0
	At sun-down	4	do.	0
	9 o'clock P. M.	10	do.	0
	12 do. do.	13	do.	0
9.	7 o'clock A. M.	14	do.	0
	11 do. P. M.	14	do.	0
10.	7 o'clock A. M.	19	do.	0

This has been the coldest morning possibly ever known in this latitude. It certainly was colder by 7 degrees than has been measured in this place by a Thermometer within 20 years.

Nine-Partners, January 10, 1797.

The mercury in my Thermometer, (Fahrenheit's scale) stood as follows:

The day before yesterday at sun-rise, 14 degrees below 0, 1 P. M. 3 above do. 9 P. M. 18 below do.

Yesterday at sun-rise, 16 below do. This morning at sun-rise, 20 below do.

Which are the coldest days we have had this winter, and greater degrees than are rarely to be found in this country.

S. RICKITSON.

[*New-York Mag.*

The College of Physicians of Philadelphia have elected the following gentlemen officers for the ensuing year, viz.

Doctor John Redman, *President.*

Doctor William Shippen, *Vice-President.*

Doctors Adam Kuhn, Samuel Duffield, Thomas Parke, Caspar Wistar, *Censors.*

Doctor Thomas C. James, *Secretary.*

Doctor Benjamin Say, *Treasurer.*

[*Brown's Philadelphia Gazette, July* 5.

At the annual election of officers for the American Philosophical Society, held at Philadelphia, on the 6th of January, the following gentlemen were chosen for the current year:—Thomas Jefferson, President.—Dr. Caspar Wistar, Dr. Benjamin Rush, Rev. Dr. Nicholas Collin, Vice-Presidents.—William Barton, John Bleakley, Rev. Dr. Samuel Magaw, Jonathan Williams, Secretaries.—Charles W. Peale, Dr. Benjamin S. Barton, Robert Patterson, Curators.—John Vaughan, Treasurer.—Andrew Ellicot, Tench Coxe, Rev. J. Abbercrombie, Richard P. Smith, Counsellors for three years.

In addition to the foregoing, the following gentlemen are Counsellors of the Society, viz. Until January 1799, Rev Dr. Robert Blackwell, Thomas M'Kean, LL. D Rev. James Davidson, Dr. Adam Kuhn.—Until January 1798, Jonathan B. Smith, Dr. William Currie, Rev. Dr. William Smith, Rev. Dr. William White. [*New-York Mag.*

The Philosophical Society have a fourth volume of their Transactions in the press.

At a public commencement, held on Friday, May 12th, 1797, at the University of Pennsylvania, the degree of Doctor of Medicine was conferred on the following gentlemen, who submitted Inaugural Dissertations to the examination of the Medical Faculty, on the following subjects:

Mr. Joseph Johnson, of Charleston, South-Carolina, *An Experimental Inquiry into the Properties of Carbonic Acid Gas, or Fixed Air; its Mode of Operation, Use in Diseases, and most effectual Method of relieving Animals affected by it.*

Mr. Benjamin De Witt, of New-York, *An Explanation of the Effects of Oxygene, or the Base of Vital Air, on the Human Body.*

Mr. James Walker, of Virginia, *An Inquiry into the Causes of Sterility in both Sexes, with its Method of Cure.*

Mr. Robert Black, of Pennsylvania, *On Fractures.*

Mr. Goodridge Wilson, of Virginia, *On Absorption.*

Mr. Samuel Jones, of Philadelphia, *On Hydrocele.*

Mr. William Allison, of Georgetown, South-Carolina, *On Dropsy, or the Hydropic State of Fever.*

Mr. John Edmond Stock, of Gloucestershire, England, *On the Effects of Cold upon the Human Body.*

Mr. James Fisher, of Delaware, *On that Grade of the Intestinal State of Fever known by the name of Dysentery.*

Mr. Colin Mackenzie, of Baltimore, *On the Dysentery.*

Mr. Francis K. Huger, of South-Carolina, *On Gangrene and Mortification.*

Mr. Edward North, of South-Carolina, *On the Rheumatic State of Fever.*

Mr. Samuel Cooper, of Philadelphia, *On the Properties and Effects of the Datura Stramonium, and on its Use in Medicine.*

Mr. John Church, of Philadelphia, *On Camphor.* And,

Mr. John Laws, of Delaware, *On the Rationale of the Operation of Opium on the Animal Œconomy, with Observations on its Use in Disease.*

An adjourned meeting of the Medical Society of the State of Delaware was held at Wilmington, on Monday, the 19th of June, 1797; when the following officers were elected.

James Tilton, President.
Joshua Clayton, Vice-President.
George Monro, Joseph Hall, Elijah Barratt, Joseph Capelle, Censors.
John Laws, Secretary.
James Sykes, Treasurer.

It will be remembered by many of our readers, that this Society, in the year 1792, published a program, in which was proposed, as a subject of prize-dissertation, the following question:

Quænam sit Potentia Nocens, ejusque origo atque natura, unde, in regionibus calidis, iisdemque humidis, Intermittentes oriuntur Febres, Remittentes etiam, variaque alia mala, quæ, æstatis et autumni tempora, grassari solent? Qua ratione hoc cœli vitium corrigi possit? Quo pacto, quibusque auxiliis istius modi morbi arceri atque tractari debeant?

The usual conditions of prize dissertations were annexed.

Within the limited time, no dissertation, deemed worthy of the prize, was received. We understand, however, that the Society, conceiving the question of great importance, intend to renew their offer of it to the public for a still longer period, with the same prize of three hundred dollars.

Extract of a letter, dated June 22, 1797, from Dr. Wilkins, of Baltimore, to Mr. Smith.

"Dr. Archer, near this place, has discovered the Rad. Seneka, "in strong decoction, to be an almost infallible remedy in the "*Croup*, or *Suffocatio Stridula*."

The President of the Agricultural Society of the State of South-Carolina, has received from Mr. Jefferson, Vice-President of the United States, upwards of one hundred different kinds of *Rice*, which have been procured by that gentleman from the Philippine Islands. We understand that several members of the society have taken some of each sample to plant. Their experiments will determine whether either of the species ought to be introduced into this country. Some of the samples are of rice which grows on high land. [*New-York Mag.*

FOREIGN.

THE Annals of Chemistry—*Annales de Chimie*—which have been discontinued for some years, have lately been revived in Paris. M. M. Guyton, *(Morveau)* Monge, Berthollet, Fourcroy, Adet, Hassenfrazt, Séguin, Vauquelin and Pelletier, in their address to the public, inform that the Annals will appear, as heretofore, in twelve numbers annually; each of which will contain from

seven to eight sheets octavo; and will be published monthly. They purpose to re-commence with the 21st volume, and to complete the Series, which left off with the 18th volume, by publishing a 19th and 20th, to consist of the most interesting experiments, discoveries, &c. that have been made between September 1795, and January 1797.

Subscriptions are received by Moreau de Saint Mery, at Philadelphia.

A Treatise on the Scurvy has been lately published in Great-Britain, by Mr. D. Patterson, a surgeon in the navy, chiefly for the purpose of recommending a new medicine in the treatment of that disease. This is a solution of four ounces of nitre in a quart of vinegar, of which, from half an ounce to two ounces, may be administered twice, thrice, or oftener in a day, according to circumstances. The same solution, he says, may be applied to scorbutic eruptions and ulcers, with advantage.—Mr. Patterson appears to have been remarkably successful by means of this medicine in the cure of scurvy. Further and more extensive trials seem necessary, to fully establish the efficacy of the *acetum nitrosum*, as it is called; but our readers will readily conceive how extensive it may become in its application, if future experience should verify the eulogies of the inventor.

Dr. Girtanner, of Göttingen, has been induced, by the publications of Dr. Beddoes, to make trial of carbonic acid gas, in the cure of consumptions. His trials prove it to be of great service in some cases, sometimes useless, and sometimes hurtful. More precise experiments are wanting to determine in what particular circumstances it shall do good and hurt.—Dr. Girtanner is prosecuting experimental inquiries into the effects of hydrogene and azotic gases, with greater prospect of success in similar cases.

Dr. Beddoes has now completed his series of publications, intituled, "Considerations on the Medicinal Use and Production of "Factitious Airs."—This valuable work abounds with the most interesting information to mankind in general, as well as to physicians in particular, whom it seems to arm with new weapons wherewith to encounter disease. Experiments already made sufficiently attest the great power and efficacy of various Factitious Airs in the cure and alleviation of different diseases; and we are led to believe, that the *Pneumatic Institution*, under the direction of Dr. Beddoes, will not fail to determine, with scrupulous accuracy, the peculiar situations to which each species of Air may be most successfully applied.

Dr. Duncan, of Edinburgh, who has for many years supported, with reputation, the Medical Commentaries, agreeable to the intention exprest in the 20th volume of that publication, has discontinued it; and having connected himself with his son, Dr. Duncan, jun. has lately published the first volume of the *Annals of Medicine*, on a plan nearly the same. To this work we are indebted for the following articles of intelligence.——

We are happy to find, that considerable progress has been made in the *Pneumatic Institution* projected by Dr. Beddoes, at Bristol. Several hundred pounds more have lately been subscribed; and we are informed, on good authority, that the proposer has now little doubt but that it will soon be set on foot in a proper way. Still, however, fresh contributions are desirable, as it would be much to be lamented, if an attempt to solve the problem of the action of differently modified atmospheres on the human body, in different morbid conditions, should be left imperfect for want of an inconsiderable sum of money.

Dr. Beddoes, we are told, soon intends to circulate the Outlines of a Plan for the execution of this design. In that paper, he will solicit the suggestions of medical and philosophical men, in order that, by a comparison of ideas, he may be enabled to dispose of the contributions to the greatest advantage, for promoting the knowledge of physiology and pathology.

Dr. Withering, of Birmingham, in a letter to Dr. Duncan, has the following observations with respect to pneumatic medicine: "With us, pneumatic medicine is advancing; and I think enough has been done to authorise me to say, that a cure of consumption is yet to be sought for. Hydrocarbonate and oxygene are the two airs that have mostly been used; and these should be diluted with eighteen or twenty times the bulk of atmospheric air. The former weakens the stroke of the pulse, occasions vertigo, and sometimes excites nausea. It produces a disposition to sleep, abates the cough, and eases the respiration in some asthmatic affections; but in active hemoptoe, it effects a cure more speedily, and more pleasantly, than I have seen done by any other means. Oxygene, on the contrary, excites the action of the arterial system, warms the extremities, and seems to invigorate the vital principle, without exhausting it. From these last circumstances you will at once conceive it applicable to a very extensive class of diseases. I have lately used it with advantage in two cases of Melancholy; and I have seen it remove the Paralysis of Lead, which had been treated to little purpose, by the other more usual means."

Mr. George Kellie, surgeon to his Majesty's ship the Iris, who has already communicated to the public, in the 19th volume of the Medical Commentaries, some interesting facts, respecting the effects of compression by the Tourniquet, in stopping the cold fit of intermittents, has since that continued to bestow particular attention to this subject: and an account of his experiments, and observations respecting it, will probably soon be published.

Mr. John Bell, surgeon in Edinburgh, who some time ago published a volume on the anatomy of the bones, muscles, and joints, has now made such progress in the prosecution of this work, that a second volume, containing the anatomy of the heart and blood-vessels, will be published in a short time.

Dr. Duncan, junior, has for some time been employed in preparing for the press a translation of the History of Medicine, by Kurt Sprengel, a work interesting to the philosopher and historian, as well as to the physician. In order to write a history of our science with advantage, it was necessary to collect, and bring under the most proper points of view, the facts which are scattered in a thousand works; to read the writers of each age and nation in the original; to enter into the spirit of the times when they wrote; and to study the history of society, and the sciences, wherever they were connected with medicine. All this Professor Sprengel has been able to accomplish; nor has he ever availed himself of the labours of his predecessors; but, with the most indefatigable zeal, derived his knowledge from the original sources.

Dr. Girtanner has long employed himself in analysing some bodies hitherto considered as simple, and thinks he has obtained the following results.

1. Phosphorus consists of azote and hydrogene, like ammoniac.
2. The fixed alkalis consist of carbone and azote, soda containing more azote, pot-ash more carbone.
3. Sulphur consists of carbone and hydrogene.
4. The fluoric acid has a compound, probably triple, base.
5. Arsenic seems to consist of carbone, azote, and hydrogene.

The proofs of these assertions are soon to be published at length in Gren's Journal of Natural Philosophy.

DEATH.

At Hanover, 7th October, 1795, John George Zimmerman, author of the works on Dysentery, Solitude, and Experience in Physic, by birth a Swiss. The highest degree of medical, literary,

and personal merits concurred in giving to this physician a more extended celebrity than perhaps to any of his profession during the present age. His works will remain an everlasting proof of his philosophic spirit, after the recollection of the amiableness of his manners has descended with his friends to the grave. The adage, "*Minuit præsentia famam*," unfortunately so often verified, was with regard to him reversed. Melancholy, the effect of too severe study, and a painful chronic disease, long prevented him from fully enjoying the respect paid him by Princes, and the fruits of his well-earned fame.

APPENDIX.

DOMESTIC.

TO THE EDITOR OF THE MINERVA.

Staten-Island, August 1st, 1796.

SIR,

REPORTS of an alarming nature having spread through the country relative to the sickly state of New-York, I was led to inquire, by letter, how far those reports deserved credit; to which the following is an answer, and by which, at my request, the author has consented should be made public.

RICHARD CHANNING MOORE.

New-York, July 20th, 1796.

SIR,

IT is true that a fever resembling the one which proved so great a scourge to our city the last year, made its appearance about Whitehall, and in the vicinity of the Exchange, early in this month; but fortunately for us, from a concurrence of happy events, the fever has entirely subsided. It had continued but a short time only, when it pleased a Gracious Providence to send us hard winds, repeated thunder and lightning, inundations of rain, and cool weather. To these causes I think we may ascribe the suspension of a formidable disease which had began to shew itself among us. And should it return again, I have solid reasons to believe that it will not be extended beyond certain limits.

You may recollect that in the frequent conversations we have had on the subject of the last year's fever, I have been uniform in my opinion, as to the causes of its production, namely, the accumulation of every species of filth and perishable matter, on the low, new made grounds on the south side of the city, and the abominable custom of filling up the slips and docks with similar materials: I have said that such causes, aided by a moist atmosphere and a hot sun, would not fail of producing the most baneful exhalations, and that their effects must necessarily be felt by those who are more immediately exposed to their influence.

The proprietors of the lots on the east side of Whitehall-slip carried out a bulk-head the last spring, with a view to extend the dock further into the river. The dimensions of the dock are very

considerable; and a maxim invariably adopted by the owners of the dock, is, that the cheapest mode of filling up is the best: accordingly carts were employed to collect such dirt and filth as all large and populous cities furnish in abundance; and with materials of this description was the dock filled up, and to give greater salubrity to the mass, there were occasionally added, dead horses, dogs, cats, hogs, &c. &c.

The exposure of Whitehall, and indeed the whole of the west end of the city, must be considered as naturally extremely healthy: The winds, during the warm season, are commonly from the sea, and arrive at this part of the town uncontaminated by passing over any unwholesome grounds. Yet such is the fact, that the poisonous exhalations which have abounded in that quarter, during the warm weather in the beginning of this month, had so changed the air, that the inhabitants on the south side of Pearl-street, between the Old-slip and Whitehall, almost all concur in their testimony, that the disagreeable effluvia have frequently obliged them, especially in the evening, to close the windows on the south side of their houses; and in several instances gentlemen have assured us, that the offensive smell has been such as to occasion vomitings.

The wharf on which Mr. Delafield's stores are erected, is in a state truly execrable, and the slips on the right and on the left, are in a condition little better. These, and such places, are visited by the *Dock* Fever—the Yellow Fever if you please,—that murderer of our own creating. Were the proprietors of these, and such like docks, compelled to live in their vicinity, the evil would soon be remedied; but people of this description are generally secure from the ravages of disease, in the cooler retirements of the country.

The present exertions of the common council, in giving a new surface of wholesome earth to the dock at Whitehall, will, no doubt, be productive of the greatest advantages to the inhabitants of that part of the city; and if the same measures were extended to other parts of the town, there would be much less reason to apprehend a return of the dock fever.

Thus, Sir, your questions are answered; you *might* have come to town with safety; you *may* come to town with safety. New-York, as I have said before, may be rendered as healthy a city as any under the sun—and when a more rigid police prevails, and the nuisances with which this city abound are corrected, you will hear no more of the ravages of particular diseases.

I am, Sir, &c.

RICHARD BAYLEY.

To the Rev.
RICHARD CHANNING MOORE.

LETTER FROM Dr. BAYLEY TO THE GOVERNOR.

New-York, November 28, 1796.

SIR,

THE desire which your Excellency has expressed to see the causes of the late Malignant Fever investigated, has induced me to submit to your perusal the enclosed narrative.

I have the honour to be, most respectfully, &c. &c.

R. BAYLEY.

BEFORE I undertake to account for the origin of the Fever which made its appearance in this city, in June last, I must be permitted to revert to certain facts and opinions contained in a work which I furnished to the public on the subject of a similar Fever, which prevailed more generally in this city, during part of the summer and autumn of 1795.

In that publication it was stated, that the Fever was first observed in the neighbourhood of Fitch's wharf, in Water-street, and that it gradually extended from thence in different ways, but more particularly in the direction of the prevailing winds.

Near where the fever first began, there were several unfinished docks, which had been receptacles for several years of every kind of filth and dirt.—There was also a considerable surface of new made ground in the neighbourhood, in a very unfinished state, upon which dirt, collected from the streets, was frequently thrown; likewise several store-houses erected on piles; and, added to these, a neglected and filthy state of the wharves.

This representation, as it regards the then condition of the docks in that part of the town, is confirmed by the letter of Mr. Fitch, an extract of which is given in the publication above alluded to, and which, as it is much to our purpose, I shall again introduce —His words are: "Although the docks in the vicinity of the store which I occupy, may be less offensive than in many other parts of the city, yet many of them are in a very exceptionable situation. The ponding of water by running a bulk head across an unfinished dock, and leaving the vacancy, for several years, to be filled up with every species of filth and perishable matter, is an object worthy the attention of the police. The situation of the grounds between Water-street and Cherry-street, is rendered very noxious by Water-street being raised above a certain level, and thus preventing those grounds from being drained. The effect of such nuisances on the health of the inhabitants of a crowded part of the city cannot be imaginary."

Those who have perused that publication, will find a number of reasons assigned why the inhabitants of the south-east part of the

city would be particularly liable to fever, during the hot months of the year. This opinion was warranted in the first place from matter of fact, as the Bilious Fever had appeared in that quarter, for several years successively; and, in the second place, as a matter of reasoning, from the relative situation and exposure of that part of the city; but fortunately the south-east part of the city had been more healthy this year than for several years past—and the causes of fever seem to have been transferred into a part of the town, hitherto reputed little liable to particular sickness.

In investigating the causes of this change, a recourse to facts only will afford a sufficient explanation.

First.—The docks spoken of in the south-eastern part of the city, which were in so loathsome a state, have been completed, and generally covered with a sufficient quantity of good earth, gravel, or sand.—The grounds have been drained, or where that was not practicable, the surface has been rendered uniform, with clean earth; the vacancies under the stores which were built on piles, have been filled up in a proper manner, and the wharves have been kept free from rubbish and filth. In short, so much care and industry have been bestowed here to remove the nuisances that so generally abounded, that where a person was before almost suffocated with intolerable stenches, one may now pass without experiencing the least offensive smell.

Secondly.—Let us see what has happened at the south-west part of the town. Between the Whitehall and Exchange slip, a new dock has been made, running, on an average, sixty feet into the river, extending 458 feet in front, and nine feet in depth. If nine square feet are calculated to be equal to a cart load, it will be found that 24,000 loads were necessary to fill up the dock, which were accumulating from July, 1795, to July, 1796. And what has been the nature of the materials employed for this purpose? It is difficult to answer the question, except in very general terms, namely, every thing subject to decay and corruption.

One third of the substance of this dock may be computed to be lodged above the ordinary height of the tides; therefore, 8000 loads of these perishable materials were exposed to the action of the hot summer sun. In the month of April of this year, I had frequent occasion to visit Whitehall. The stench which already issued from the dock was highly offensive; and, on inquiry, I found that the matter which had been employed to make the new ground consisted chiefly of the dirt which had been accumulating in the streets during the winter season; and that, besides dogs, cats, hogs, &c. there had been actually two horses buried in the rubbish, which had died in the spring, in a small hovel erected on the margin of this nuisance.

Reflecting on this state of things at Whitehall, and recollecting

what had happened in another part of the city, under similar circumstances, I found my mind strongly impressed with the probable consequences; and was led from thence to converse with several individuals of the Corporation on the subject. But nothing material could be done to guard against the supposed probable mischiefs. There was a contract between the proprietors of the ground and other individuals, for filling in that dock, with which the magistracy did not think themselves authorized to interfere, unless it was declared to be a nuisance on oath, or by the presentment of the grand jury.

About the middle of June, the offensive smell arising from the new dock, and other nuisances in the neighbourhood, were very generally observed, in that quarter of the city; and their effects were manifest in many who complained of head-achs, sick stomachs, &c. &c.

The situation of the Exchange-slip, as a source of noxious exhalations, I feel myself obliged to notice, also, particularly. This slip, from its length and narrowness, from its being the receptacle of an extensive common sewer, and especially from having a great proportion of its muddy bottom exposed at low water, sends forth effluvia, which in a very sensible manner contaminate the air to a considerable distance around.

In a letter which was published in July last, I had occasion to mention the frequent disagreeable state of the air, in the south-west part of the city. It was there stated, "That the poisonous exhalations which had abounded in that quarter during the warm weather, had rendered the air so noxious, that the inhabitants on the south side of Pearl-street, between the Old-slip and Whitehall, almost all concur in their testimony, that the disagreeable effluvia have frequently obliged them, especially in the evenings, to close their windows on the south side of their houses; and, in several instances, gentlemen have assured us, that the offensive smell has been such as to occasion vomiting." These are circumstances of great moment, and are entitled to serious consideration, if they are regarded only as causes which *increase* the malignity of diseases.

In the latter part of June the fever began to shew itself about Whitehall, and in the vicinity of the Exchange. But it continued for a short time only, when the concurrence of high winds, heavy rains, much thunder and lightning, and cool weather, which happened about the middle of July, were probably the causes to which we may attribute the suspension of the disease. This at least was rendered probable, because, as soon as the weather became warm and dry again, it was accompanied by those noxious exhalations, which again produced the fever. Thus the disease appeared, went off, and came on again, according as the weather fa-

voured, or impeded the generation of those vapours which, in their operation on the human body, are the exciting cause of fever.

I must take notice, also, of some other circumstances relative to many of the houses about Whitehall; which, if they were not of themselves, in any instance, a cause of fever, must certainly be considered of a nature to aggravate the disease, when brought on by other causes—namely, the state of the ground in the rear of the houses, which, in consequence of the streets being raised, is in many places considerably below the ordinary level; and, therefore, liable to accumulate matter, which, in the process of decay, produce vapours, which render the air impure—and which, in confined situations, are often the cause of fever: also, the old and decayed state of many of the houses, and the inattention to cleanliness, which is always neglected where people of the poorer sort are much crowded together. The bedding and clothes of the sick, under these circumstances, must be supposed to become daily more and more impregnated with the exhalations arising from their bodies; and hence arises the dreadful havock made by infectious diseases in the small houses of the poor; and on such as are destitute of the means of cleanliness, and who, of necessity, are obliged to remain a length of time without changing their clothes.

The further we inquire into the sources of the fever, the greater is the analogy discovered to be between the state of things at Whitehall, and in that part of the city where the fever first appeared last year.—Accumulations of decaying animal and vegetable matter; a part of the ground below the general level; poor people crowded together in small uncleanly apartments, were circumstances so perfectly coincident, that, were particular effects to take place in one situation, we should naturally expect similar effects to take place in the other.

If the fever of last year, and that of the present year, were brought on by the same causes, it may possibly be asked, how it happened, that in the one instance it was so widely extended, and in the other confined to such narrow limits. This question admits of an easy solution. It is generally acknowledged, that epidemic diseases are either produced or widely diffused by some particular qualities of the atmosphere; and the extraordinary prevalence of heat and moisture in the air, during the summer and autumn of the last year, must still be recent in the memory of the inhabitants of this city; whilst the state of the air, during the warm season of the present year, has been much cooler and drier than usual.

Thus the fever of the last year was more generally felt, because a peculiarity of the weather predisposed the body, or rendered it more susceptible of those causes which produced the disease:—

whereas, the weather of this year occasioning no predisposition, the fever was generally confined to a situation where it required the exciting cause to be of itself sufficiently concentrated to produce its effects.

Many of the men who belonged to the market vessels which came to the Whitehall dock, sickened, from being exposed to the exhalations arising in this situation. The boatmen of the Staten-Island and Elizabeth-Town ferry-boats, suffered very generally, although many of them were so cautious as not to sleep on shore, and to avoid all communication with the sick. Several of them died of the disease.

Many transient persons from Staten-Island, who visited frequently at Mr. Catleyou's, residing at Whitehall, during their stay at New-York, sickened, and soon died. It was said, that Mr. Catleyou's family were sick with the Yellow Fever; but this report was not well-founded. The family were not well during any part of the warm weather, but none of them had the Bilious Fever. Their complaints were such as are commonly the consequence of living in foul air, viz. sick stomachs, and head-achs, attended with considerable lassitude.

The above facts respecting transient persons taking the fever, are confirmed by Dr. Clark, of Elizabeth-Town, New-Jersey, who, in a letter with which he has favoured me, observes, that "in many instances of the disease among the ferry-men, who resided chief of the time at Whitehall; or among other persons "who slept there—and all had taken their passage from Whitehall "dock, within twelve days of the attack."

It is worthy of remark, also, that the disease, according to Dr. Clark, occurred in those only who had been in New-York. He writes, "that amongst the cases which came within my practice, "and from the best information of others, there was no instance "of the disease taking place in any, except those who had been at "New-York, and particularly at Whitehall."

Dr. Clarke states further, "that there was no instance of the "fever amongst the nurses, or attendants upon the sick." This fact is confirmative of the opinion which we have always endeavoured to support, that the fever in question is not a contagious disease.

The operation of local causes in producing diseases is well exemplified in the account of the Remitting and Intermitting Fevers of the West-Indies, given us by Dr. Hume; "and while," says he, "the hospital remained there (at Port-Royal) the sick were seldom seized with complaints of this kind."

"When another hospital was built on the opposite side, though only at the distance of four miles, not one man in an hundred escaped these fevers, who were sent to the hospital, and remained

in it three or four weeks: and even the marine guard who were relieved once a fortnight, or three weeks, fared no better."

Dr. Hume describes the situation of this hospital to be in the neighbourhood of stagnant water marshes. He then adds, "it was the damp winds, filled with the putrid exhalations, which occasioned the frequency of remitting, or Yellow Fever, and intermitting disorders of this place. At my request, this hospital was deserted, although in all other respects it was good, and had cost near fifty thousand pounds sterling."

Several plantations near this hospital were unhealthy from the same cause.

It would be endless to quote authorities upon this subject: nor is it necessary to look to a distance for them. What has happened within our own state abundantly confirms the fact, as may be seen from Dr. Williams's letter, inserted in my publication upon the fever of the last year.

I do not think it necessary to be more particular in reciting facts, or in detailing these circumstances which, in my mind, are fully competent to explain the origin of the fever which has excited so much alarm, and proved so great a scourge to the citizens of New-York. It is the less necessary, because I mean to shew by the following documents, that the disease was not, as many have insinuated, nay, positively declared, brought here from abroad—And if we can advance sufficient testimony to invalidate that opinion, the conclusion necessarily follows, that the fever was occasioned by causes of a domestic nature; and, therefore, the fact we are solicitous to establish, receives that degree of probability which, in matters of this kind, gives an assurance equal to demonstration.

I shall then, in the next place, bring forward what appertains to the vessels supposed to have introduced the Yellow Fever in New-York.

The first suspected vessel was the ship Antoinette. On the 25th of May, the ship Antoinette arrived in this harbour from Brest, in ballast, and anchored in the North-river. Two days after her arrival, I was requested to visit sick on board. The commander of the vessel assured me, that the men had not been confined, nor did he think their indisposition such as to render it necessary they should be sent to the hospital; one of the men was then at work upon deck, and the other came from below immediately on being called; as, however, the ship was to be brought to a dock, it was thought expedient that these men should be sent to the hospital.

That these men had not complaints of an infectious nature shall not rest on my assertion alone. The opinion and declaration of Dr. M'Farlane, under whose care they were placed, will carry with them much stronger evidence.

October 20, 1796.

SIR,

I HAVE just received a few lines from you, wherein you request me to declare my opinion respecting the nature of the complaints of the two patients from on board the ship Antoinette, who were sent to Bellevue Hospital, and placed under my care.

I do not at present recollect the names of those people, as I did not note the histories of their complaints. Their cases, however, have not escaped my memory.—The one complained of a pain in his breast, attended with cough and difficulty of breathing. His strength was considerably impaired; the complaint, which he attributed to cold, having been of some duration. By the application of a blister to the sternum, and the continued use of expectorants, he was discharged, as cured from the hospital.

The other laboured under a complaint, *hernia hermoralis*. By the use of mercurial fractures, saturnine applications, the suspensory bandage, &c. he was relieved, and discharged as such, by his own request. I am, Sir, &c.

JOHN M'FARLANE.

To Dr. R. BAYLEY, *Health-Officer*.

On the 29th of May the Antoinette hauled to the dock at Whitehall. In this situation the crew could not come on shore, nor return on board, without passing over the new made ground; and thus were the men exposed to the exhalations which arose from it, whilst in the ship, and occasionally in a greater degree, by their visits on shore. During the month of June most of the men of the Antoinette complained of an unusual weakness; and in the beginning of July, several of them were attacked with fever.

Two of these cases terminated in black vomit and death.

The cause of the sickness on board of the Antoinette being no longer a subject of conjecture, the remedy became obvious; namely, the removal of the vessel to a more healthy situation; and as the ship had laid more than a month at the Whitehall dock, it must be supposed, that the air beneath her decks had become completely saturated with the noxious vapour arising from that mass of decaying materials, of which the dock was composed.

It was deemed necessary, therefore, to have recourse to the measures commonly employed to purify vessels. For this purpose the Antoinette was hauled out in the stream, and after the process of purification was over, she was directed into the north-river to take in her cargo. After this period the men on board her remained in good health, except Captain Hendricks, who had the ague and fever.

Now, as the men who were complaining at the time of the arrival of the Antoinette were not sick with fever, of which Dr. M'Far-

lane's letter is sufficient evidence, and as the fever did not appear among the crew until five weeks after she had been at the Whitehall dock, and more than ten days after it had appeared on shore, it must acquire more than an ordinary share of prepossession in any one to believe, that the Antoinette had any agency in the origin of the fever at Whitehall.

On the 29th July the brig Patty arrived at this port. After she had left this place, a report was circulated, and by many credited, that this vessel had introduced a malignant fever in this city. Although, on this subject, I had no doubt, as I had taken a manifest of the healthful situation of the brig Patty, and the crew had undergone my personal examination, yet I was anxious that every suspicion should, as far as possible, be removed from the minds of the citizens; I was, therefore, induced to write to the commander of the brig Patty, who was then at Boston, to request that he would give me an attested statement of facts, respecting such sickness as might have existed on board the brig during her voyage, and the condition of the health of her crew at her arrival in this port; whether she had any fever on board after that period, or whether any person had sickened in Boston after her arrival there, who had had communication with her. To these inquiries I shortly after received the following attested certificate:—

"*This is to certify, that during my voyage in the brig Patty, from Boston to the West-Indies, and back to New-York, none of my crew were sick of a malignant fever; and that, on my arrival in New-York, all my crew were in good health, except my mate, who was sick with the ague and fever, and who was taken out of my vessel, and put on board a packet to be sent home to Trenton; and since my arrival in Boston, my crew has remained in perfect health as before; nor has any person who has been on board the brig Patty, received any, or been apprehensive of any disorder whatever.*

"JOHN SNOW.

"*August* 3, 1796."

The above statement of Captain Snow is so clear, and conclusive, that still to entertain any doubt would imply a mind disposed to contemn truth, even under the serious garb of a sacred oath.

Thus, then, have I taken a cursory view of the circumstances relative to the origin of the Yellow Fever. In reviewing the situation of that part of the city, we have found abundant reason for believing, that the fever was produced by causes of a local nature, and originating there.

The importance of this fact renders me extremely solicitous, that the truth of it should be generally established, and strongly impressed upon every mind; for if measures are to be pursued, calcu-

lated to prevent the calamity in future, the extent and adequateness of those measures must depend upon this conviction.

It is to be hoped, that we may not deceive ourselves, by a mode of reasoning adopted by some, which, however plausible it may appear at the first view, must certainly prove fallacious upon examination. It is urged, that the city of New-York has remained for many years exempt from any particularly fatal diseases; and we have no greater reason now to suppose ourselves more liable to sickness than formerly; and that if diseases of a malignant kind should at any time prevail among us, we ought to look to some foreign source for their origin. The answer to this argument is, that the state of things are every day changing. The city is extending its dimensions; the houses are becoming more compact, and crowded together; the inhabitants are increasing in number; and more especially the mode of making *new ground*, which renders a considerable part of the city a *low level*, are changes which place us in a situation different from any previous period.

This kind of calculation, it is to be feared, is not by many entered into; but it is one which is entitled to serious consideration, in as much as it takes in those circumstances which have a particular influence upon the health of the inhabitants of the city of New-York.

Before I conclude I must take the liberty of mentioning to your Excellency, what has hitherto been the condition of the hospital lately established upon Bedlow's Island. I am induced to do this, in order that the inconveniences under which it has laboured, may be rendered apparent, and from a hope that measures will, in consequence, be taken to provide for the hospital, in such manner as may be necessary to complete the establishment, and give it extensive utility.

The necessary alterations and repairs which the buildings on Bedlow's Island required, to render them fit to receive the sick, were not completed till the middle of August.

As soon as these were done, application was made to the commissioners of health, for a supply of necessaries to accommodate the sick, who, at this period, were sent to the hospital, from Whitehall, and from several vessels just arrived from sea. The commissioners directed the beds and bedding which had been used the year before at Bellevue to be sent to the new hospital on Bedlow's Island; but, unfortunately, those articles were in a very filthy state: but as the sick were already at the hospital, we have had no alternative but to select the cleanest of those articles and use them in that state. The hospital also was unprovided with wearing apparel, than which nothing is more necessary, as well for the comfort of the sick, as to prevent the introduction of infection in the hospital.—Under these circumstances, the consequen-

ces were such as might naturally be expected; for within eight days of the time when those articles were brought to the hospital, those people who had been employed in transporting the bedding from Bellevue, the nurses who attended the sick, and the steward of the house, were attacked with fever. The attending physician, Monsieur Bouvier, was also indisposed for several days.

From this distressing situation, however, the hospital was soon happily relieved by a supply of beds, bedding, and such clothes as were necessary for frequent changes; and placing the sick in a state of the greatest cleanliness. From the period that this was done, neither nurse, visitor, nor any kind of attendant were known to be attacked with fevers.

(Signed) RICHARD BAYLEY.

To Gov. JAY.

New-York, Dec. 22, 1796.

ARTICLE II.

LETTER *from Dr.* WARREN *to Mr.* ELIPHALET PEARSON, *Corresponding Secretary of the American Academy of Arts and Sciences.*

SIR,

IN the month of December last, I communicated to the public a number of facts relative to the fever which prevailed the last autumn in the town of Boston, calculated to counteract the effects of a publication in the city of Philadelphia, in which the opinions of the Physicians on the nature of the disease, and the method of practice, were grossly misrepresented.

My principal object, in what was then offered, was to establish the following propositions:

1st. That the physicians of the town were unequivocally of opinion, that the fever originated from local causes.

2dly. That, in the treatment of the disease, the stimulant plan had not been adopted in any stage of its existence.

3dly. That the depleting system, in general, had been used from the beginning. But,

4thly. That bleeding, in particular, was by no means generally practised; and that there were strong reasons for believing, in opposition to what had been asserted in the publication referred to, that, where it had been used, the effects had been unfavourable.

I had then prepared, as an elucidation of the above, the following history, which may perhaps suggest some motives for a greater degree of caution in adopting a rigid adherence to system in medical practice; and furnish the means of comparing this with other

fevers which have proved epidemic in various parts of the United States. And I now submit it (as I judged it a more proper mode of communication on a professional subject) to the candour of this Academy.

The first appearance of the disease was on the 25th of August, 1796, in a family at the south-easterly part of the town of Boston, near a considerable extent of flats, which are daily exposed, for some hours, to the action of the sun.

A lady of this family was the first victim of the disease. She was seised with rigors, a general distress throughout the whole system, with a white and moist tongue, dry skin, frequent and weak pulse; but without any very alarming appearance until the third day, when the pains, which now became more severe, with laborious respiration, a slight redness of the eyes, a sleepiness, and insensibility, followed at night by a sudden sinking and intermission of the pulse, announced the extreme hazard of her situation. Active cathartics were prescribed in the beginning, and a blister was applied over the whole anterior part of the thorax; but no benefit was derived from either, and she died at the end of the fourth day.

The next person attacked was a female of the same family. She was taken sick within twelve hours of the first, with pains in the head, back, and lower extremities; a vomiting, which continued incessant through every stage of her illness, great oppression at the breast, a weak and quick pulse, moist skin, and yellow tongue. Opium, and calomel, with other purgative medicines, were administered, without having been a moment retained in the stomach; her pulse became intermittent on the third day; and on the fourth a fatal termination ensued.

Neither of these patients had any yellowness of the skin in the course of their sickness: there were no reasons to believe they had ever been exposed to contagion—and they both imputed their illness to their having sit at an easterly window in the evening air, when heated with exercise.

On the 2d of September, a son-in-law of the above-mentioned lady was seized with a fever of the same kind; and within three days from that time, his wife and her two brothers, all of whom had been closely attendant on their deceased mother. Three of these were treated with large and repeated doses of jalap and calomel; two of the three took emetics; one of them was bathed with cold water, dashed over the whole body on the third day from the attack; and having been kept cool, they all recovered. The fourth was in a situation peculiarly unfavourable when attacked; she took such doses of jalap and calomel as were thought best adapted to her state; and on the fourth day she died.

I would here remark, that in two of these cases the symptoms were, from the first, more mild than in those which proved fatal—that they were destitute of some of the most alarming symptoms with which the others were attended—had no inflammation of the eyes, nor difficulty of respiration, but a thicker fur upon the tongue, which was of a dark colour towards the height of the disorder; with more distinct pains in the head, back and limbs, with exacerbations at night; and ran on until the eleventh day, before any remarkable change in the symptoms; after which, the recovery was slow, as in a common typhus, and was not completed until the fourth week.

The next person whom I visited with the disorder, lived at Oliver's Dock; and within two or three days from this time, I was called to five others at the south part of the town, and one in the neighbourhood of the first-mentioned family.

Between this and the 18th September, when I was called to Mr. Newell, the person whose situation excited so much apprehension in the town, I had visited about a dozen others, with somewhat similar complaints, but very different in the degree of violence with which they were attended. In the former, the skin, on about the fourth day, became yellow; on the sixth, petechiæ were discovered over all parts of the body; and a most obstinate dysentery, followed by colliquative diarrhœa, proved fatal on the eighth. In many of the latter, after slight rigors, and obtuse pain in the head, for the first twenty-four hours, together with a sense of heat or burning at the stomach—a hæmorrhage from the nose often took place, and continued to be a troublesome circumstance for several days, without any remarkable mitigation of the symptoms.

In these, spontaneous vomitings rarely occurred—but when they did, large quantities of bile were thrown up from the stomach, and emetics, or cathartics, invariably produced the same effect. The pulse was generally small and irregular—The tongue coated with a saburra of a yellowish cast; and the excretions from the kidneys were often turbid during the augmentation of the disease, highly tinged with bile, and sometimes depositing a copious sediment, before any thing like a crisis had been discovered in the patient.

The crises were seldom very sensible or perfect; and when present, were commonly most conspicuous in the excretions of the skin; and the above was the usual form in which the disease afterwards continued to appear, with now and then an instance, in which it approached more nearly to that in which it commenced.

In the first stage, emetics were sometimes strongly indicated from the incessant nausea, which prevented any medicine from resting on the stomach—but generally, a dose of from 10 to 15 grains of calo-

mel, even under this circumstance, often answered a better purpose by discharging very copiously a bilious matter from the stomach, as well as intestines; and by frequent repetition, effected the cure. Antimonials were sometimes given between the doses—blisters were occasionally applied—the drinks were principally acid; and wine was forbidden.

The disease, however, unless conquered by a very early exhibition of this medicine, often ran on to about the 11th day, and sometimes to the end of the third week; and in no instance, after the case of Mr. Newell, did it prove fatal within that period.

In three patients whom I visited, the cold bath was used in the hottest stage of the fever, to very great advantage. In two cases only, what is called the black vomit, took place. From the beginning of September the fever was slowly increasing; and I find that the number of patients, at any one time under my care, was greatest in the first week of October; from which time it gradually declined, until about the middle of December, when, I believe, it had altogether disappeared.

A very great proportion of those taken sick were situated near extensive flats, particularly about the easterly, southerly, and westerly skirts of the town. The place called Oliver's Dock, where the disease was most prevalent, was exposed to exhalations from foul substances, lodged about the wharves and docks of that quarter, with buildings so constructed as to admit of but very imperfect ventilation, and with large numbers of inhabitants crowded together in a small space.

When the disease first made its appearance the weather was warm; in about the middle of September it became cool; plentiful rains having previously fallen; and as the cool weather advanced, its violence and mortality were gradually diminished.*

In most families where one person had been sick, others were soon taken down of the disorder;—in some, almost every adult person became ill; the children generally escaping. I knew of no instance of any black person being infected.

The disease, as far as I could discover, was as often contracted from those who had it lightly, as from those who had it in a more dangerous degree. In several families where one had died, no other person received any infection; in others, one had it lightly, and several others contracted it from him; some of them in the milder form, and some in the more severe.

The mortality of the disease was by no means great; of fifty-two persons whom I attended, nine died; two of these, in consequence of circumstances foreign from the disease; of the number, two were children, five were women, and two were men.

* Herein it seems to differ from what has been remarked with respect to Typhus, which has been found to increase as cool weather advanced.

From the best information I can obtain, not above thirty persons died of it in the whole season;—several persons were buried in the night, and this having excited a great degree of alarm in the country, served as a foundation for the most exaggerated accounts of the mortality with which it was attended.

The town was remarkably free from other disorders through the whole of the autumn;—no dysenteries prevailed in it, and few of the usual diseases of children.

Whether there is any essential difference between the fevers denominated *bilious*, or whether they vary only in degree, according to circumstances under which they are produced, I shall not presume to decide.

Dr. John Hunter seems to have held the latter opinion, and it is not improbable, that the same disease may have its symptoms and periods, so much under the influence of exterior causes, as at times to bear some of the appearances of one belonging to a different class of disorders. However this may be, there seems clearly to be a great difference in degree at least, between that which has been above described, and the Philadelphia fever of 1793. Having, almost every fall, seen a considerable number of cases very similar to the above, not excepting the black vomit, nor the yellow skin, together with the quality of contagion, and other circumstances usually attendant on fevers of this denomination, I have been induced to believe, that the disorder in question was no other than what has more or less prevailed here almost every year, and is what is properly termed, a Bilious Remittent Fever.

That it originated from noxious substances, exhaled into the atmosphere from putrifying animal or vegetable matter, or both, is extremely probable from the places in which it was most prevalent,* and that a confined situation, or filthy state of the streets, alleys, and by-places of the town, will, as it becomes more populous, rents higher, and consequently the poor more closely crowded together, further expose us to the danger of such diseases, is a serious truth, which may, perhaps, in some future day, be too fatally evinced. And it may not be improper here to remark, what is too seldom attended to, that nothing can contribute so much to individual preservation, as personal cleanliness, and by frequent bathing, removing impurities from the skin, and promoting a free perspiration.

* It has been generally thought, that continued fevers are the offspring only of human effluvia, and intermittent, of marsh-miasmata; yet there is sufficient reason, from some recent instances of these diseases, for believing, that this limitation does by no means generally prevail.

Animal substances, of which many are to be found in these places, intermixed with vegetable, are said to putrify when exposed to the sun, more quickly after having been covered with salt than with fresh water.

In case of actual infection, the sick should invariably be separated from the well—the rooms cleansed, and the clothes washed or destroyed.*

The success of Dr. Rush's prescription of the jalap and calomel might perhaps be considered as a proof of the affinity of this fever to that of Philadelphia; but if the success of the latter medicine, in the malignant species of throat distemper, has been established, as has been affirmed, it will appear the less extraordinary, that it should succeed in this disease, even on the supposition of its being of a putrid nature.

If, in the common Bilious Remittent Fever, it appears that the use of active cathartics, and particularly large doses of jalap and calomel, produce the most salutary effects, it will be an additional satisfaction to that benevolent man to find a part of his treatment of the Yellow Fever extended to diseases in which he had not perhaps contemplated its efficacy.

JOHN WARREN.

* Dr. J. C. Smyth, in a report to the Lords Commissioners of the Admiralty of Great-Britain, of the last year, endeavours to establish, on the foundation of experiment, the advantage of fumigation with the vitriolic and nitrous acids, for cleansing infected clothes and buildings. He prepared an earthen vessel, containing sand heated in an iron pot; and having placed in it a tea-cup with half an ounce of highly concentrated vitriolic acid, after it had acquired a proper degree of heat, poured into it gradually, an equal quantity of nitre in powder; this was stirred with a glass spatula, and carried through the wards of the sick. It at first excited a slight cough among the patients, which soon subsided, and the air was in an astonishing degree sweetened by the process. He cautions against using metallic vessels, as the fumes might, in that case, prove injurious.

Dr. Trotter, in his Medicina Nautica, a very late publication, scruples the efficacy of this method; but there is reason to hope it may prove a valuable discovery.

It is to be remarked, that all cloathing of animal matter, such as woollen and silk, being more subject to decomposition, is one of the most dangerous sources of infection; and, therefore, the utmost care is required in purifying them.

FOREIGN.

ARTICLE I.

Account of the Effects of the NITROUS ACID *on the Human Body. By Mr.* William Scott, *Surgeon in the Service of the East-India Company. First published in the Bombay Courier of April* 30, 1796.

THE following attempt to extend a little the limits of the healing art, is inscribed as a tribute of respect to the character of Dr. James Anderson, Physician-general at Madras.

In August, 1793, I employed myself for some time in making experiments on the bile, a secretion that is connected in a great degree with many of the diseases of this country. I wished to unite some of the calces of mercury with the resinous matter of that fluid; for I imagined that I might discover some chemical affinity between those substances, and be able to see by what means this metal is so singularly qualified for removing obstructions* of the liver.

I had collected, for experiment, a quantity of the resinous base of the bile of a buffalo, which I had separated very carefully from its soda, and from the lymphatic matter with which it is united. I had put a dram or more of this substance into a vessel, to which I added about half of the same weight of the red calx of mercury, with ten or twelve ounces of water. On heating the whole together, I was surprised to observe, that the base of the bile became remarkably more soluble in the water. I cannot say that I observed the red colour of the calx in any great degree altered; but it is known to retain its brilliancy with different quantities of oxygene.† I filtrated this bitter solution, which deposited the base of the bile, as the water evaporated in the ordinary heat of the atmosphere. I shall, at another time, consider this subject with a little more attention.

M. Fourcroy has observed, that water dissolves a small portion of the base of the bile. In this experiment, a considerably larger quantity was taken up than water could have dissolved, which I attribute to the oxygenation of the resin, by the pure air of the calx. I had some reason to think, that obstructions of the liver do often consist of a deposition of the resin of the bile, which, I now began to suppose, might be rendered soluble in the animal fluids, by the pure air of the mercurial preparations that are given for the disease. I have seen livers, on the dissection of the dead, of a pearl colour, and much enlarged, which, I suspect, were composed, in a good measure, of this resinous matter. I have even found it, from accurate trials, in a considerable quantity, in the substance of a liver that was apparently without disease. Is the well known effect of new grass, in dissolving the biliary calculi of the gall-bladder, that cattle get in the winter-time, to be accounted for from the pure air of green and ascescent vegetables?

It is acknowledged, that all the calces of mercury which are used in medicine, contain a quantity of pure air; but I know of no direct experiment having been hitherto made, to prove that the effect of mercury in diseases of the liver, or in other maladies, depends on this principle, and not on the metal itself. The experiments that

* I have used the word OBSTRUCTION to express the chronic disease of the liver, so common in this country.

† See Experiments by Van Mons on the Red Oxide of Mercury.

I had made on the base of the bile, inclined me to wish to take myself a quantity of pure air, united to some substance for which it has no great attraction. I reflected on the different ways that are employed by chemists to oxygenate inanimate matter; for I believed, that the same chemical attractions would produce a similar effect in the living body, although they might be disturbed in their operation by the vitality of the principles of which it is composed.

The nitric acid, as may be supposed, was one of the first substances that occurred to me as fit for my purpose; for it is known to contain about four parts of vital air, united to one of azote, with a certain proportion of water. These principles can be separated from each other by the intervention of many other bodies, as chemists find every day in their operations. I was led, besides, to give a preference to the nitric acid, from observing, that it dissolves very completely the resinous base of the bile. I have since found, that the celebrated M. Fourcroy had made the same observation before me.

Before I began to take the nitric acid, I consulted all the accounts of it that I could procure, with a view of learning something of its effects on the human body. The result of this inquiry was but little satisfactory; for I only found that it had been given as a diuretic, in very insignificant quantities, or recommended in general terms, where the mineral acids are supposed to be useful. I did not think myself warranted to administer it to others from such imperfect information: but I resolved to take it myself; and I thought I was particularly qualified to determine its effects, as I had reason, for a long time before, to complain of my liver.

In September, 1793, I began to take the nitric acid. I mixed about a dram of the strongest that I could procure, with a sufficient quantity of water; and I was happy to find, that I could finish that quantity in the course of a few hours, without any disagreeable effects from it. The following is the journal that I kept of myself at the time.

11th September, 1st day. Took at different times about a dram of strong nitric acid, diluted with water. Soon after drinking it, I feel a sense of a warmth in my stomach and chest; but I find no disagreeable sensation from it, nor any other material effect.

2d. I have taken to-day a considerable quantity of acid, diluted with water, as much as I could easily drink during the forenoon.

3d. I have continued the acid. I feel my gums affected from it, and they are somewhat red, and enlarged between the teeth. I slept ill; but could lie for a length of time on my left side, which, from some disease in my liver, had not been the case for many months before. I perceive a pain in the back of my head, resembling what I have commonly felt when taking mercury.

4th. My gums are a little tender. I continue the acid as before; I still find a pain in my head, and about my jaws, like what arises from mercury. I perceive no symptoms of my liver complaint.

5th. I have taken the acid; and always feel an agreeable sense of heat after drinking it. I spit more than usual.

6th. I continue the acid. I observe my mouth sorer to-day, and spit more.

7. I think I am now sufficiently oxygenated. I feel my mouth so troublesome, that I shall take no more acid.

From this time my mouth got gradually well, and I found my health considerably improved.

I now began to suppose, that I had discovered a remedy for that chronic disease of the liver, which is so much more common here than the acute hepatitis. I thought that it might in some respects be preferable to mercury, as it did not appear to produce the inconveniences that arise from the use of that metal. I have given it since to a number of people, who had taken mercury for hepatic obstructions, without being effectually cured; and I have found it in many cases produce the most agreeable consequences. If it were proper on this occasion to be more particular in detailing the cases in which I have administered this remedy, I believe I could make it very probable that I have not been deceiving myself. In the acute hepatitis, I have hardly employed it; for where the life of a person is in immediate danger, I have thought it my duty to make use of remedies that are established.

I have, with the best effect, oxygenated several people with the nitric acid, who were much reduced by tedious intermittents. That kind of fever is often connected with a diseased liver or spleen. In consequence, I think, of this remedy, I have seen them recover their natural colour from a leaden or bilious hue, and regain their strength from a long continued weakness. I believe, if given in a sufficient quantity, it would be very useful in the fever of this country, which has been called bilious, or nervous, or putrid, and for which mercury appears to be a specific.

I have met with two instances only in this country of diabetes. They were both natives, and in the decline of life. I cured them both by mercury, after many other remedies had been tried. One of these men had a relapse of his disease, which I removed a second time with the nitric acid. I thought this a satisfactory correspondence in the effects of the two remedies. May they not both be useful in that disease?

The great resemblance that I perceived in myself, between the effects of mercury and of the nitric acid, made me anxious to know if the acid would remove the various symptoms of syphilis. In September, 1793, it was administered, at my desire, by my friend Mr. Anderson, surgeon of the 77th regiment, to a person who

had a head-ach that came on every night, and which had long been suspected to arise from lues. He had taken several courses of mercury on this account, which carried away all the uneasy symptoms; but they as constantly returned after a certain period. On using the acid for about a fortnight, he got perfectly free from his head-ach, and he remained very well for a few months, as was usual to him after mercury.

I have now had a pretty extensive experience of the good effects of the nitric acid in syphilis; and I have reason to believe, that it is not in general less effectual than mercury in removing that disease in all its forms, and in every stage of its continuance. I think that in some cases it has even superior powers; for I have succeeded completely with the acid, when mercury, administered both in this country and in Europe for years together, had failed of success. We appear to be able to carry the degree of oxygenation of the body to a greater length by means of the nitric acid, and to continue it longer than we can do by mercury.

A mass of mercury, in the circulation, produces many disagreeable effects, that make it often necessary to give over its use before it has answered its intention: but the nitric acid may be taken a long time without any material injury to the health; nor are its effects on the mouth, in producing inflammation, and a flow of saliva, so disagreeable as from mercury.

A man could hardly offer to his species a greater blessing than a new remedy against any of the host of diseases that assail us: but the reputation of specifics, with the exception of a few instances, has arisen only from the weakness of the human mind. Am I, too, deceiving myself, and attempting to lead others into error?

As the acid that I distil is not strong, and is of unequal strength at different times, I am regulated chiefly by the taste in giving it. I put half or three-fourths of a Madeira glassful of it in two pints of water, or I make two pints of water as acid as it can well be drunk. This quantity is finished every twenty-four hours, taking about a Madeira glassful only at a time.

I have sometimes removed syphilitic symptoms with the acid in five days; more commonly, I think, they give way in a fortnight; but sometimes, though seldom, they continue for twenty days without any apparent relief. I must confess, that in some cases I have failed altogether; but in those cases, mercury had long been given to little purpose; the bones were highly diseased, and the habit probably of a peculiar kind. I have cured syphilis with the acid, under a variety of forms, where no other remedy had ever been employed, and for above two years I have seen no relapse in those cases. I have administered it against the primary symptoms

of the disease, and I have given it for exostoses, for carious bones, for nocturnal pains, for eruptions and ulcers of the skin, and for all the train of misery that is attendant on lues. I have the pleasure to see, that several of my friends have begun to use the nitric acid in syphilis, and in other diseases. An account of their experience, which every body will esteem the most respectable authority, will make the subject of a future paper.

I hope this slight account will induce medical practitioners to try the effect of the nitric acid in syphilis, a disease which, in this climate, is so frequently the disgrace of their art. Too often the miserable wretch is but worn down sooner by the very remedies that are called in for his relief.

> Quæsitæque nocent artes; cessere magistri,
> Phyllirides Chiron, Amythaoniusque Melampus.
> VIRG. GEORG. III.

ARTICLE II.

LETTER *from Dr.* RICHARD PEARSON.

(CIRCULAR.)

Birmingham, July 1, 1796.

SIR,

HAVING, for the last two years, prescribed the VAPOUR of VITRIOLIC ÆTHER to patients labouring under PHTHISIS PULMONALIS; and having, both in hospital and private practice, experienced the best effects from its use in this frequent and formidable disease, I am preparing to lay before the public a report of the cases in which it has been given, accompanied with remarks on some other remedies that may be employed with advantage in the cure of CONSUMPTIONS. Being desirous, in the recommendation of a new medicine, to have my own evidence supported by the concurrent testimonies of other practitioners, I take the liberty of calling your attention to this subject, and of submitting to your notice my method of using this application, which is simply this: I direct the patient to pour one or two tea-spoonfuls of pure or vitriolic æther (or of vitriolic æther, impregnated with cicuta, in the manner hereafter described) into a tea-cup or wine glass, and afterwards to hold the same up to the mouth, and draw in the vapour that arises from it, with the breath, until all the æther is evaporated. This is repeated three, four, or five times in the course of a day, for a month or six weeks, more or less, according

to circumstances.* The *first effects* of this application, are an agreeable sensation of coolness in the chest, an abatement of the dyspnæa and cough, and, after ten minutes or a quarter of an hour, easier expectoration. The *ultimate effects* (provided other proper measures be not neglected, for this is not to supersede the use of other medicines, but to be employed in conjunction with them) are, a removal of the local inflammation, a cleansing and healing of the ulcerated lungs, and a suppression of the hectic fever. To assert that all these beneficial consequences will flow from its application in every species and degree of phthisis pulmonalis, would be adopting the language of quacks, and insulting the understanding of every one experienced in the profession; but to say that some of these good effects are likely to result from its use in most instances, and most of them in a great number of instances, is only asserting what an experience of two years in a situation where the opportunities of making trial of it have been very frequent, has fully confirmed.

The salutary operation of æther, applied to the lungs in the form of vapour, I have found to be greatly promoted by several volatile substances that are soluble in it; but by none more so than by CICUTA. By macerating a sufficient quantity of the dried leaves of this plant in æther, for the space of three or four days, or at most a week, and occasionally shaking them together, a very saturated tincture is obtained, which may be inhaled in the same manner, and in the same doses as the pure æther. My proportions are a scruple, or half a dram, of the powdered leaves to every ounce of æther. The narcotic particles of the cicuta, conveyed in this manner along with the æther-vapour to the diseased lungs, act, as a topical application, with the best effect; hence, æther thus impregnated succeeds, in most instances, better than when it is employed alone. The only unpleasant circumstance attending the inhalation of this ætherial

* The loss of a part of the vapour, which is unavoidable in this mode of applying it, may be prevented, as a Medical Friend has suggested, by setting the tea-cup containing the æther in a small bason, and inverting a funnel over it. By applying the mouth to the tube of the funnel and making an inspiration, the patient draws in all the vapour along with the atmospheric air, which enters at the bottom of the funnel. In winter, the evaporation may be promoted, by setting the tea-cup in hot water; in which case the funnel is to be inverted, not into the bason containing the water, but over both tea-cup and bason, so as to rest immediately upon a table, tray, or plate, having a bit of double paper, or a quill, put under it, to allow the external air to enter more freely.

Children, and even infants, may be made to inhale this vapour, by wetting a handkerchief with æther, and holding it near the nose and mouth. It must be confessed, that this is attended with great waste; but in urgent cases of HOOPING COUGH and CROUP, in which it promises to be of use, this consideration can have little weight.

tincture of cicuta, is a slight degree of sickness and giddiness, which, however, soon go off.

It cannot be expected that I should here point out every symptom, or set of symptoms, which indicate or forbid the use of this application. I shall only remark, that it appears to be best suited to the florid, or what is commonly termed the scrophulous consumption. Where the pulmonic affection is complicated with mesenteric obstruction, or diseases of the other viscera, or a dropsical condition, it affords but transitory relief; and in the very last stage of the disorder, the proper time for using it is past.

Should you be induced, Sir, by this address, to make trial of the VAPOUR of VITRIOLIC ÆTHER, impregnated with CICUTA, in phthisical cases, I shall be glad to be favoured with your remarks and observations upon it, whether in its favour or not. All communications on this subject, are requested to be sent before *the first of January next*, as after that time the Treatise will be printed.

N. B. In CATARRHS, the æther-vapour, without the cicuta, succeeds very well. In these cases it is seldom necessary to continue the inhalation more than three or four days, or a week at farthest.

RICHARD PEARSON, *M. D.*

☞ The reader is desired to substitute the word *syphilis*, instead of "siphilis," wherever it occurs in pages 77 and 78.

THE

MEDICAL REPOSITORY,

VOL. I.—No. II.

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ADVERTISEMENT.

In presenting their subscribers and the public with a second Number of the Medical Repository, the Publishers take pleasure in being able to announce that the undertaking has been so far prosperous, that they entertain no doubt of its failure from want of materials. The resources within their immediate controul, and those which are furnished them by the friendship and disinterested aid of able and diligent correspondents, have made it certain that the efficient patronage of their fellow-citizens of the United States, is all that is requisite to its full success. Of the truth of this the subscribers will probably admit no suspicion, when they observe that the number of pages, in the two publications already made, surpasses, by a third, what was promised in the original proposals.

But, a short delay has happened in the delivery of the present Number, the causes of which it is proper to explain. This has been partly occasioned by an unavoidable obstacle to the timely receipt of a very valuable article inserted in the original part of this work. But even this would not have retarded the delivery of this Number, but for unexpected and inevitable avocations on the part of the Printers. This circumstance delayed the completion of the impression for a week; an accident the like of which care will be taken to prevent in future. The effect of it might have been avoided now, by the omission of the Appendix; but it was thought that the important information it contains would well compensate for a tardiness of a few days.

Some doubt or misapprehension having occurred, as we are informed, relative to the 5th of the proposed conditions of publication, the publishers take this opportunity of explaining its intent more clearly.

Any subscriber is at liberty to stop his subscription at the time of the receipt of any Number of this publication; he paying, at the time, the sum required by the said 5th article, and giving notice to the publishers. After this he will receive an additional number and no more. The reason of this regulation is, to avoid the trouble of transmitting, and receiving back or losing, a number after the work is discontinued. The subscriber will, in fact, receive as many numbers as he shall have paid for; and the publishers will be allowed a seasonable notice of his having discontinued his subscription.

New-York, Nov. 7, 1797.

ERRATA.

The reader is requested to correct the following errors of the press.

Page 169, line 30, for *conserva* read conferva.

166, line 2 from the bottom, for *exerted* read excited.

170, line 29, insert *the* between *upon* and *gaseous*.

171, line 9 from the bottom, for *health* read healthy.

173, line 2, for *inquiries* read inquirers.

191, l. 11, from the bottom, for *fifty-handed* read hundred-handed.

MEDICAL REPOSITORY.

VOL. I.—No. II.

ARTICLE I.

ON THE DIGITALIS PURPUREA.

By JAMES MEASE, *M. D. Resident Physician of the Port of Philadelphia.*

THE *Digitalis Purpurea*, or Purple Fox Glove, is a medicine which, for some time past, stood high in the list of the Materia Medica, but, for various reasons, appears to have, in some measure, lost the character once formed of it. The frequent trials made by the judicious Dr. Withering, and the repeated success that has attended its use in his hands, certainly shew, that the opinion he entertained of it, as a valuable addition to the stock of medicinal plants, was well founded. Many other physicians have likewise spoken favourably of its good effects; but many instances of failure have also been recorded, and in cases too apparently favourable to its operation. I have seen it exhibited both in public and private practice, and have given it myself, sometimes with advantage, and at other times with little benefit, or obvious injury. The causes of this different success have never been fully ascertained; but the result of the present experience of this medicine, I believe, is rather unfavourable to its character. From my own reflections and observations, I am disposed to attribute the want of success of *digitalis* less to its own inert quality than to the circumstances attending its exhibition, which I shall point out in the following paper; and I shall also endeavour to ascertain the manner most proper to exhibit the medicine, and the cases most favourable to its operation.

The causes influencing the success of the *digitalis*, may be referred to the following heads.

1. The season of collecting the plant.
2. The part of the plant used.

3. The mode of curing it.
4. The adulteration of the plant.
5. The manner of exhibiting it.
6. The condition of the system at the time of use.

I. The *season of the year in which the plant is collected* will have a very considerable influence on the effects produced on the system. It is well known, that the active parts of vegetables possess the most power when the sap is present in them; and, for this reason those plants whose virtue resides in the root, are directed to be taken up early in the spring, before the sap has ascended: and, on the contrary, vegetables, whose medicinal quality exists in the upper parts of the plant, are directed to be used in summer. Accordingly, as Dr. Withering has found the leaves the most efficacious part, he directs them to be collected "about the time the "flowering stem has shot up, and when the blossoms are coming "forth." Contrary, however, to this rule, I have known the *digitalis* collected late in summer, and autumn; and it is not to be wondered if this, combined with other causes, should produce a disappointment to the expectations of the prescriber.

II. The *part of the plant employed* ought likewise to be attended to when forming a judgment of its virtues. The parts constantly used by Dr. Withering *are the small leaves;* and he is so cautious to have these alone, that he directs the *leaf stalk*, and even the *mid rib* to be thrown away. But without attending to this rule, I have known every part of the plant indiscriminately mixed, and exhibited in this state; and have heard an opinion of its virtues formed from the little effects produced by such a partial and unfair proceeding. I do not know that the root possesses any properties different from those of the small leaves, or that it would in any way prove injurious by being mixed therewith, otherwise than weaken the effect of the active part: yet, in the exhibition of a medicine, so celebrated as the present, in a disease that so often baffles the best directed efforts for a cure, every circumstance which may in the least influence its operation, should be strictly guarded against; and as long and repeated experience has convinced Dr. Withering of the superior efficacy of the small leaves to the other parts of the plant, it is certainly incumbent upon every prescriber to pay attention to this caution. I have known, however, every part used without distinction, except the root, both in a separate and combined state; and I have no doubt a neglect of this rule has been one common source of the failure of this medicine.

III. A frequent cause of the failure of *digitalis* may be attributed to a careless mode of preparing it for use. From its sensible qualities it appears to be of a volatile nature; and Dr. Withering, aware of this circumstance, directs it to be slightly dried

in the sun-shine, or on a tin pan before the fire, so as barely to allow its reduction to powder. There is great reason to believe, however, that its active quality has been often either entirely or greatly dissipated by being long dried by a hot fire, from a supposition, that this was requisite to permit its reduction to powder.

IV. The *adulteration of the plant* with other vegetables is a source of failure, to which I know some unsuccessful cases may be ascribed; for, notwithstanding the small value of the plant, and the ease with which it may be cultivated, I have been informed of some very iniquitous adulterations practised with a variety of other plants of similar colour, but possessing qualities so inert, that they must have interrupted or weakened the effects of the digitalis, by mechanically clogging its active parts in the stomach.

V. The various modes of exhibiting this medicine may, I think, have some influence upon the effects produced by it. Dr. Withering preferred an infusion of the plant to every other form, and directs one drachm of the dried leaves to be infused, for four hours, in half a pint of boiling water, adding to the strained liquor half an ounce of any spirituous water, and an ounce of this infusion to be given twice a day to an adult. If the patient be stronger than usual, or the symptoms very urgent, this dose may be given once in eight hours; and, on the contrary, in many instances, half an ounce at a time will be quite sufficient. But, without attending to this rule, I have known the digitalis prescribed in the various forms of decoction, pills made with soap, and in powder mixed with prepared chalk or magnesia; and though the two last substances may not act in any opposite way, yet they may divide the particles, and, by clogging them, prevent application to the stomach, and thus diminish its activity. A tedious decoction will dissipate the virtue of many plants less volatile than *digitalis;* but a slight one will, no doubt, injure it, and ought, therefore, never to be employed. Pills are often made up with such substances as render them soluble with difficulty. If we even suppose soap free from this objection, we, nevertheless, do not know what secret effect may be produced by it on particular stomachs, to interrupt the action of the medicine; and certainly it will not be so readily applied to that organ as in a watery form.

VI. But exclusively of the above causes of the failure of digitalis, and even supposing the proper part of the plant to be used, and in the manner directed by Dr. Withering, there is still one source, from which I am well convinced many instances of its want of success have arisen. This is, *the particular condition of the system* at the *time* of its *exhibition;* and I am disposed to think, it is the most powerful of any mentioned, though the others have doubtless contributed. It is a misfortune attending the introduction of a new medicine, that when it has been given with success

in several cases of a particular disease, it soon obtains the character of a specific, and is exhibited in every case, without discrimination or attention to the state of the complaint. The consequent failure which must necessarily follow, in some instances, is soon spread about, and the character of the remedy commonly sinks in proportion to its previous elevation. The history of many once famed, but now neglected remedies, fully proves this; and the *digitalis* has been nigh adding to the list. A bare recital of the effects of other medicines which have been much longer in vogue than the *digitalis*, and have been successful in many diseases, will show the folly of expecting uniform good effects from this or any other. I may adduce that familiar medicine, Peruvian Bark, as in point, which is well known to be so generally the most effectual cure for the intermitting fever we are acquainted with, that it has long since obtained universal credit; and yet, how frequently do we observe this famous remedy fail in that very disease, and afterwards the disease yield to other remedies, whose mode of action is directly contrary to that of the bark.* What then are the states of the system in dropsies, and other complaints in which the *digitalis* does good? In order to determine this question, let us take a view of its mode of action on the body. From the time it is taken into the stomach, and shews any operation, it is of a debilitating nature. This is evinced by its amazing power of diminishing the action of the heart and arteries in frequency and force; and by the relaxation perceived over the whole system, as well from direct effect as from the nausea induced. The confusion sometimes produced in the head, shews it possesses narcotic powers. Similar effects are produced by cicuta, stramonium, and other medicines of that class. This effect upon the arterial system has been noticed by every physician, who has given any account of the *digitalis*, and is particularly mentioned by Dr. Withering himself. Hence we should naturally imagine, it would prove useful in diseases, attended with inflammation or an excessive action in the arterial system; and, accordingly, Dr. Withering, when speaking of its use in *mania* and *hæmoptöe*, directs it to be confined to persons with "a *bounding pulse*." In such cases Dr. Ferriar, of Manchester, found the most benefit from it. I have seen it relieve a violent pain in the head, with which a lady had been long troubled, and which occasionally brought on a vertigo; the pulse was not very full but tense, and a slight degree of in-

* I allude to the cure of obstinate intermittents, especially those protracted into the winter, by bleeding; a practice I was first taught by Dr. Rush, by whom I had seen it frequently tried with success. See his Med. Inq. and Obs. vol. i. Dr. Gardiner also mentions the utility of purging in intermittents;—which is of the same debilitating tendency, though inferior in power, to bleeding. See Gardiner's Animal Economy.

creased action was evinced by other symptoms. From these facts we should be led to conclude, without hesitation, as to the particular states of diseases, in which it would be most productive of good effect, and we should totally omit it in dropsies or other complaints, which were to be removed by the cure of debility, and confine it intirely to those accompanied by increased arterial force. Some may startle at the opinion of dropsy being ever accompanied by such a state; but that it does often attend various species of watery collections, I am fully convinced, from my own experience* of the efficacy of bleeding and purging, as original remedies, or after the repeated use of tonics usually prescribed without good effect, and sometimes evident injury, and the experience of others. It will not be expected that I should digress upon this subject;—those who wish to see it fully treated, must be referred to the Medical Inquiries of Dr. Rush, whose arguments are incontrovertible. In dropsies, attended with this state only, that gentleman found benefit from digitalis; and yet Dr. Withering says, that in dropsy, it seldom succeeds in men of great strength, of tense fibre, of warm skin, of florid complexion, or in those with a tight and cordy pulse, producing the diuretic effects, in a kindly manner only in those cases where the pulse is feeble and intermitting, the

* Among many cases that have occurred, in which debilitating remedies have succeeded in removing dropsies, I will just note a remarkable one. In the summer of 1793 I attended Walter Mitchell, a waterman, for anasarca. He had been for three years previously occasionally attacked by the fever and ague, which he always cured by bark. In April, 1793, it returned in a violent manner, but it was now accompanied by a great swelling of his belly and lower limbs, and by epileptic fits; from which he was so far relieved, by repeated bleeding, as to be able to follow his usual employment. Shortly after he was exposed, in the lower part of the Jersey coast, to cold and wet, and starvation, for nigh two days, by his boat being stranded, and great fatigue in walking before a house could be found. He was again taken ill, was much swelled, had regular chills and fevers, *pulse full* and *hard*. I gave him three grains of the powder of digitalis three times a day, which produced nausea, pain in the stomach, reduction of the pulse, but not much discharge of water. I then gave of nitre and jalap, each 10 grains, every two hours, for several days, which increased the urine very considerably, and lessened the swellings. He again exposed himself; the symptoms again returned with more violence. I now bled him to 12 ounces, and repeated his powders last mentioned. A vomiting and purging came on after a few doses, and, in the course of five hours, he discharged two gallons of water: a diarrhœa succeeded for two days, and evacuated all the water. He now took bark with good effect, and would have been cured, had he not again returned to the water, which brought back his swellings. He then went to Europe.—In Dr. Donald Monro's Treatise upon Dropsy there are several cases related of blood-letting, purging, and vomiting, curing that disease; and also in the various periodical publications of Great-Britain; but it is rendered beyond a doubt by Dr. Rush, that inflammation frequently accompanies this disease. See Med. Inq. and Obs. vol. ii.

countenance pale, the lips livid, skin cold, and other symptoms of debility are present. (P. 189.)

The experience of others is directly opposed. Dr. Rush says he is satisfied, that in atonic dropsies, digitalis is not only a useless but dangerous remedy. Dr. W. Currie,* of Chester, Great-Britain, is of the same opinion. Dr. Ferriar found it to fail in several cases accompanied by the state described by Dr. Withering, as favourable for its operation. (P. 361, Med. Hist. and Reflect.) One patient was affected with gangrene in his feet, and was 70 years old. My own experience coincides with that of the two latter, having seen it do essential injury in several cases of dropsy of the atonic kind, by increasing the debility already existing, to an alarming degree. In one old man, with ascites, the pulse was reduced to 40 in a minute, and it otherwise much deranged his system. To account for the success of this remedy in dropsies, and other diseases of too much action in the arterial system, is readily done. But to reconcile the opposite testimony of Dr. Withering and others, with respect to their different success in dropsies of too little action, is very difficult: nay, to reconcile the contrary advice of Dr. Withering himself, who recommends the digitalis in mania and hæmoptöe, "with a *bounding pulse*," and in dropsies with a *weak* one, is impossible. And here I may repeat a remark I formerly made, viz. "that a medicine whose primary operation "is the reduction of the force of the arterial system, when this is so "intimately connected with the general strength of the body, should "only succeed in those cases where the latter is considerably ex-"hausted, appears not only to be paradoxical, but ill-agrees with the "uniformity observed in the operations of nature, in other parts of "the animal œconomy."† It is incumbent upon Dr. Withering to account for this apparent opposition in his own sentiments, and to satisfy the doubts of physicians, arising from the action of the remedy being directly contrary to the principles upon which alone certain dropsies can be cured. I may also remark, that it is much to be wished physicians were more accurate in noting the state of their patients systems, at the time of prescribing this and other remedies; and also the force of the pulse at the same time, with its frequency; which, though so constantly stated, is of far less consequence in determining the situation of the system, as to the important point of the existence or absence of inflammatory disposition, than the former. We should thus arrive, with more certainty, at the true virtues of a medicine, and be able to reconcile the contradictory accounts of physicians respecting its utility in the same disease.

* Mem. Med. Soc. Lond. Vol. iv. p. 11.

† Obs. on the Weather and Dis. for Oct. 1791. See American Museum.

The inattention of physicians in the exhibition of *digitalis*, to the rules prescribed by Dr. Withering, has not escaped his notice, as appears by the following extract of a letter from him to Dr. Woodville, and published in the "Medical Botany" of the latter. "Under my own management, under that of the medical practitioners in this part of England, and, I may add also, in the hands of some worthy and respectable clergymen in village situations, it continues to be the most certain, and least offensive diuretic we know, in such cases, and in such constitutions as I have advised its exhibition. I have also the satisfaction to find, by letters from some of the most eminent physicians in different parts of England, that it is equally useful and safe in their hands. But I complain of the treatment this medicine has had in London. Its ill-success there cannot be altogether owing to difference of constitutions. Dr. Lettsom * has related his unsuccessful attempts with a degree of courage and of candour, which do the highest honour to his integrity; but no one can compare *his* choice of patients with *my* declarations of the fit and the unfit, or the doses prescribed, and the perseverance he enjoined, with my rules and cautions, without being astonished that he could suppose he had been giving this medicine 'in the manner prescribed by me.' I am fully satisfied that had I prescribed it in such cases, such forms, such doses, and such repetitions as he has done, the effects would, in *my* hands, have been equally useless, and equally deleterious; I must, therefore, suppose, that he had forgotten what I had written, without being conscious that his memory had deceived him. Had it been otherwise, after perusing the cases I had published, at p. xx. and 51, of my account, he would hardly have thought it necessary to have published more instances of what I had stigmatized as bad practice, or to have sought for further proofs, that an active and useful medicine might be employed, *so as to prove* deleterious poison."

It may not be improper to add some cautions and observations upon the use of digitalis, not mentioned in the above paper, for the information of those who may not have seen Dr. Withering's work, and may wish to exhibit the medicine.

The Doctor desires the medicine to be given in the doses, and at the intervals mentioned above, and to be continued until it either acts on the kidneys or stomach, pulse or bowels: to be stopped upon the first appearance of any of these effects; the patient to drink very freely during its operation.

In case of *ascites* and *anasarca*, when the patient is weak, and the evacuation of the water rapid, the use of a proper bandage is

* Memoirs Med. Soc. Lond. Vol. ii.

indispensibly necessary. If the water should not be wholly evacuated, it is best to allow an interval of several days before the medicine be repeated, in order that food and tonics may be exhibited.

The flow of urine will often precede, sometimes accompany, and frequently follow, the sickness at stomach, at the distance of some days, and not unfrequently be checked by it, especially if given in too large doses. The sickness will sometimes cease, and recur again as violent as before, and will continue to recur for three or four days at more distant intervals. These sufferings are not necessary, and are no objection to the use of *digitalis*, neither is a stone in the bladder.

ARTICLE II.

OBSERVATIONS UPON THE BAD EFFECTS SOMETIMES PRODUCED BY EATING PHEASANTS.*

By James Mease, *M. D. Resident Physician of the Port of Philadelphia.*

IN the month of February, 1791, several persons in Philadelphia were seized, in about three hours after dining upon pheasants, with giddiness, violent flushing of heat and cold in the face and head, sickness at stomach, and repeated vomiting. These symptoms were soon succeeded by delirium, weak pulse, and the greatest debility, which threatened approaching death. Some cases were marked by the preservation of the senses, but a total inability to articulate. By plentiful draughts of warm water, or chamomile tea, the vomiting was promoted, and the offensive matters discharged. Gentle stimulants and cordials, as wine whey, volatile salts, and liquid laudanum, were afterwards exhibited, and most commonly with success. In some cases, however, the event was not so fortunate; from the co-operation of other causes, the attack was more violent, and either death, or a protracted recovery, ensued.

The late George Bryan, one of the judges of the supreme court of Pennsylvania, dined, with Mrs. Bryan, upon roasted pheasants; and after walking out two squares, called at the house of a friend, where he drank a draught of cyder. He was soon afterwards informed of the sudden indisposition of Mrs. Bryan, and ran home in great haste. Being upwards of 60 years old, short, and of a clumsy built, the exertion to his system was immense; and he had no sooner arrived home, and beheld Mrs. Bryan in the alarming situation described, than he fell upon the floor, apparently in an apoplectic state, which, in the course of a few days, proved fatal. Mrs. Bryan, after being very ill, recovered.

The same day, an old lady, Mrs. G. also dined upon roasted pheasant; her negro woman also, advanced in life, eat part of the same bird, and as in the case of Mr. and Mrs. Bryan, no other animal food was eaten. In about four hours after I was called to their assistance, and found them both labouring under the above symptoms: both recovered by plentiful dilution and gentle cordials.

* *Tetrao Cupido*, Lin. This is the *partridge* of New-England.

Another instance of the bad effects produced by eating those birds fell under my notice in April, 1792, in a gentleman aged 62; who had, for a long time, been subject to the gout; but, for some months before, was particularly affected with it in his breast, causing the troublesome symptom, *Angina Pectoris*. Having somewhat recovered from the violence of the disease, he was tempted to gratify a returning appetite, by dining upon a pheasant. His meal consisted almost intirely of the back, except a small proportion of bread. In about four hours after, while sitting in his arm chair, he was seized with a faultering voice, and in a few minutes was intirely deprived of the power of utterance, though he was sensible of his situation, and had a great inclination to speak. A gentleman in company with him at the time, perceiving his alarming situation, dispatched a messenger for Dr. Rush, his family physician, who arrived in a short time, and found him apparently in the agony of approaching dissolution. His pulse could scarcely be felt: he, nevertheless, took about 12 ounces of blood from his arm immediately, and with the most sensible good effects: for, during the flowing of the blood, he exclaimed, "I am better." An emetic was afterwards administered, and I arrived during its operation. He discharged the remains of his meal, which by reason of the slow and feeble action of the stomach was but half digested. An anodyne was afterwards exhibited, which produced a calm, refreshing sleep: a blister was also applied to the breast to relieve the difficulty of breathing, under which he laboured from his old complaint, and was now rendered more severe by the irritation of his meal. During the night he slept tolerably well; but I was frequently alarmed by interruptions in his breathing, and by the irregularity and interruption of his pulse. He soon recovered from the effects of the pheasant; but his old complaint harrassed him to the last.

These, and several similar cases, are the foundation of my opinion of the occasional poisonous quality of pheasants; and, in order to account for their bad effects, I would observe, that in the winter, and early in the spring, these birds live chiefly upon buds of trees, and particularly upon those of the laurel,* which is one of the few shrubs that preserves its verdure throughout the winter, and, from many melancholy proofs, is known to be highly poisonous. It is not improbable, therefore, that the noxious quality of the laurel may have been communicated sufficiently strong to the pheasants to produce the effects described. Some of the faculty, who heard of the above cases, accounted for the symptoms, by supposing that the juice of the laurel, extracted by the bird, had been mixed with the sauce from the carelessness of the cook in opening

* *Kalmia latifolia*, LIN. Sometimes called the *shrub ivy*.

the craw; but this could not be the case in the last instance, for the craw of the bird was carefully examined after the accident, with a view of ascertaining the fact, and was found intire, with its contents preserved. I do not know whether the craws of the pheasants upon which the persons dined who are mentioned above, were also examined, but the single fact is sufficient to prove that the opinion advanced is false. Neither do I apprehend any necessity exists, to have recourse to the supposition, to account for the bad effects of these birds. We have a number of similar facts to prove, that not only the flavour, but the quality of certain plants, and even minerals, may be communicated to the flesh of different animals feeding upon them. Fishes, it is well known in the West-Indies, are sometimes highly poisonous, although in the taste or smell there may be nothing indicative of a noxious quality; and so powerful is the poison, that a gentleman informed me he has seen a person at dinner fall off his chair and expire, in St. Domingo, two minutes after having swallowed a morsel of a yellow sprat.* Hence the common practice of putting a silver spoon or coin into the pot in which the fish is boiled, that a judgment may be formed of the safety or danger of eating them by the permanency or change of colour in the silver. The London mutton is known to taste strong of turnips, with which the sheep prepared for market are chiefly fed. Dr. Rush informed me, that when at the college of Princeton, almost the whole of the students were severely purged by dining on wild pigeons, which had fed upon the berries of phytolacca, or poke.

But it has actually been asked, if the bad effects observed from the pheasants are produced by the impregnation of their flesh with the laurel, why does it not also poison these birds? This question can easily be answered by referring the fact to a law which appears to be established through the scale of animal creation, by which certain articles of food are intended for the support of particular animals, while, to others, they may be highly injurious. Every one acquainted in the least with natural history, will recollect instances of the truth of this. The example of the fish will be immediately referred to as direct; and, I may add, the horse is killed by eating hemlock, which affords a very agreeable nourishment to the hog: although, therefore, the laurel produced no bad effect upon the pheasants, yet the instances above related are decided proofs of the bad consequences from eating these birds. The same

* The poisonous effects of these fishes are attributed to their feeding upon copper banks, in the West-Indies. Dr. Goldsmith (Animated Nat. Art. fish) notices the fact, and this theory; but disbelieves it, as, he says, he knows of no copper mines in America. Had he lived, however, a few years longer, he would have found that they abounded in America, and were actually worked at the time he declares his ignorance of their existence.

peculiarity, with respect to certain articles of diet, prevails among men. Many substances are deemed delicious by some, which, to others, are both disagreeable and hurtful: the almond, for instance, is commonly esteemed a pleasant fruit, but there are some who will be thrown into fever, attended by universal eruption, by eating a single one not deprived of its husk.

It is true that pheasants are often eaten with impunity, and I never eat more of them than during the very season when the above instances occurred of their bad effects. But I imagine that the circumstances under which they are commonly used, tend to diminish their hurtful properties: For, 1. From their great delicacy, they, in general, form only a part of our meals, and are mixed with a large proportion of other articles of food, previously taken in, and which constitute the solid part of our repast. The part of the pheasant eaten is thereby involved in such a manner as prevents the direct application of it to the coats of the stomach, and, consequently, from producing the bad effects that followed their use in the above cases. The wine and other stimulating and diluting liquors taken in, tend likewise to counteract and weaken the effects that might otherwise be produced; but in the cases I have related, nothing else was eaten except a trifling proportion of bread, and nothing drank but a glass of small beer: the noxious quality of these birds had thus a greater opportunity of being exerted, by being directly applied to the stomach, and having nothing to counteract it.

2. Another circumstance tending to increase the noxious quality of the pheasants, was the lateness of the season in which they were eaten, when the laurel had begun to vegetate, and, consequently, to acquire a greater degree of activity than during the intensity of the winter, when its powers are weakened by the concentration of the sap in the root. This cause operated particularly in the last case.

These facts are fully sufficient to shew, that though the pheasant has commonly been esteemed an harmless bird, they ought to be eaten with caution; and suggest the propriety of a rule in prescribing them as an article of diet: for, as they are generally esteemed a great delicacy, and very light food, they may be wished for by convalescents; and, as their stomachs are in too highly excitable state to take wine or any other food to counteract their bad quality, it will be right to debar them from these birds, and to substitute in their place other articles of a less suspicious nature, and of easy digestion, as rabbit, partridge, or chicken.

ARTICLE III.

OBSERVATIONS UPON THE YELLOW FEVER, AND ITS PROXIMATE CAUSE.

In a Letter from Dr. GEORGE DAVIDSON, *dated Fort-Royal, Martinique, Sept.* 20, 1796, *to* JAMES MEASE, *M. D. Resident Physician of the Port of Philadelphia.*

THE Yellow Fever has again made its appearance here, in a more violent degree than I ever recollect seeing it. The rainy season, which, in common, sets in about the first week in May, did not make its appearance until the month of July. June proved a very agreeable month; towards the latter end we had remarkable sultry weather. The thermometer, in the shade, stood for several days at 90 deg. at two P. M. This proved a prelude to the appearance of the disease. I have no doubt when the mercury stands at 86 deg. or above it, for several days, the weather being at the same time calm, that exhalations from swamps, and miasmata from putrid vegetable and animal matter, chiefly are capable of producing the disease; that, at the same time, it may be propagated by contagion, the heat and putrefaction still operating: accordingly I found, that in several of the ordnance ships, which had arrived from St. Vincent and Grenada, after the partial reduction of those islands, having the disease on board, soon propagated it to the other ships, along side of which they were laid up during the hurricane months in the Carenage, a secure but unhealthy part of the bay of Fort-Royal; surrounded on every side by swamps, and a nasty beach, rendered still more so by the want of a certain convenience unknown in a French island. The disease spread rapidly during the months of July and August, and was only checked by the plentiful rains which fell towards the latter end of August and beginning of September.

To the history of the disease I have little new to add. The symptoms at the beginning were more violent and more distressing than in former years. The pains were not confined to the head, loins and calves of the legs, but were general, particularly from the knees to the lower extremities, and from the elbows to the wrists, for several hours preceding the attack. A pain, confined to the foreheads and socketts of the eyes, dimness of sight, faintness and syncope, generally ushered in the attack: these were soon followed by a burning heat over the whole body, sickness at stomach, pain under the right breast, shifting to the left, anxiety and

uneasiness in every posture. The belly was in general costive; the tongue, throughout the whole disease, generally much covered with a slight brown scurf. In some fatal cases I have observed a singular appearance, a jaggedness towards the edges, and a deep furrow in the centre, the tongue at the same time moist. The pulse was seldom full in the commencement, but irregular, and frequently intermitting; in many cases and those the most dangerous, it did not exceed in frequency nor strength the natural state. The urine was high coloured and spare, and sometimes a suppression took place. Bloody urine was a fatal symptom. Deafness, when it happened early, was always a fatal symptom, but, toward the end, favourable. It is worthy of remark, that no bile is ever thrown up or down. The biliary ducts appear to be spasmodically affected.

I have met with several cases of bubos, so called, both in the groin and arm-pits. Anthraces and carbuncles I have seen in four or five cases. The carpenter of the ship John, of Philadelphia, had one on his elbow, which discharged several quarts of blood, under which he sunk: two more appeared upon the ancle and instep of the same foot: the hæmorrhage could only be restrained by the application of pledgits of vitriolic acid and water.

Several of my medical friends have prosecuted dissections at the hospital: from these, and my own observations, I am clearly of opinion, that the brain is the principal organ affected, and that the other affections are merely symptomatic. Wherever other appearances were met with, they might perhaps be traced to some previous labes of the constitution, which determined the disease to exert its effects upon that weakened organ.

I am only sorry to observe, that this disease often attacked with such violence as baffled every attempt. The inflammatory stage was but of short duration, and the symptoms of exhausted nervous energy so soon appeared, that we were afraid to use the lancet. The few cases in which I tried it, did not succeed. Of the cold bath used in the early stage of the disease, before the constitution was materially affected, or a particular determination had taken place, I have a high opinion. I have mentioned the circumstances in which I found it useful to Dr. Rush in 1794. I have lately tried it in a protracted case with great success. The calomel, though it sometimes failed, upon the whole, succeeds best. I generally gave in the beginning the solution of *vitriolated magnesia*, joined to half a grain tartarized antimony, taken *par reprise*. It seldom vomited above thrice, and purged the patient plentifully. There was generally a torpor of the lymphatic system, which prevented the action of the mercury. We were obliged to give it in large doses before a salivation could be exerted. Dr. Chisholm, the ingenious author of the treatise upon the Yellow Fever of Gre-

nada, now surgeon-general of the ordnance, has been with us here some weeks, and we have attended several patients together. At his request I have tried the mercurius calcinatus, in doses of two grains, joined to one of opium. It has succeeded in three cases within ten hours, in one case a salivation was excited, and the patient was out of danger, as I have in every case observed. Purging, though it relieved in the beginning, did not contribute to the cure: the mercury seemed to act by exciting a different action intirely, and I was obliged to add opium, to prevent it going off by the bowels. Vomiting, and the train of symptoms connected with it, was best relieved by the vitriolic æther, blistering the stomach and purging. I was told of one case of recovery at St. Lucia, from the black vomit, by the patient drinking a quantity of sallad oil and pickle. The head-ach was relieved frequently by applying cloths wet in the solution of *muriated ammonia* to the head previously shaved. It excited the mercurial action upon the salivary glands in one case very suddenly.

I have already mentioned my experiments* upon the composition of atmospheric air, which I have frequently repeated in presence of the late Dr. Charles Webster, of Edinburgh, Dr. Saunderson, of London, and Dr. Chisholm. I found an absorption of from 67 to 70 parts in the 100: a proportion of oxygenous gas more than double what is observed in Europe. It may, perhaps, serve to explain the proximate cause of fever in general, and of this in particular. Permit me to give you my sentiments upon the subject. I have to apologize for the haste in which I write, and the want of the ornaments of composition to render the subject

* Theſe were communicated in a former letter, dated Aug. 22, 1795. "May 23. lat. 34 deg. 30 m. long. 64 deg. wind W. moderate, fair; therm. 69 "at noon: one meaſure of nitrous air, and one of atmoſpheric; there re- "mained 1. 54.—May 27, lat. 29 deg. 50 m. long. 60 deg. wind N. N. E. "moderate, clear and fair; therm. 74. mixture of nitrous and atmoſpheric "airs 2, remained 1. 50, or half abſorbed.—Lat. 23 deg. long. 58 deg. therm. "78 ſame. June 20, Trinidad; lat. 10 deg. 20 m. long. 62 deg. one mea- "ſure of nitrous and one of atmoſpheric air mixed, left only 1. 34. There "was of courſe 66 abſorbed. I was aſtoniſhed to find this reſult. The "thermometer was at 87, or nearly ſo, three different days on which this "experiment was made. Not having Dr. Prieſtley's obſ. with me I cannot "ſay what proportion of nitrogene gas itſelf might have been abſorbed: "the abſorption, however, was inſtantaneous: the water had not time to "act upon the gaſes. This much is certain, that we have it now in our "power to account for the ruſting of metals, fermentation and putrefac- "tion, from the greater proportion of oxygene in the air. The production "of hydrogene gas from the diſſolution and putrefaction of animal and ve- "getable ſubſtances, no doubt is chiefly accelerated by heat and moiſture, "and heat alſo enables the atmoſpheric air to ſuſpend the muriate of ſoda "taken up by evaporation from the ſea, which has alſo its ſhare in the pro- "duction of ruſt."

more interesting. We must premise, however, that the whole is nothing more than a probable guess; but I may lead others to investigate the subject, who are possessed of more abilities and leisure.

A question here occurs, why is the Yellow Fever so fatal to Europeans just arrived, or people from cold climates; those of a robust habit of body and prime of life? Dr. Rush, in a conversation with me, supposed the blood of Europeans, newly arrived, was more highly oxygenated. I will rather make another supposition. Europeans, newly arrived from cold climates, have a firmer texture of fibres, cold tending to brace and invigorate the body. Exercise in cold air braces and constringes the surface, and remarkably increases the appetite and digestive powers; beside this connection between the stomach and surface, a remarkable connection subsists between the stomach and lungs. Whatever tends to brace the former increases the action of the lungs, a greater quantity of atmospheric air is taken in, and a greater proportion of oxygene is fixed; hence the vigour infused over the whole system; and hence the vigour and energy that so suddenly follows a full meal upon animal food, and a few glasses of generous wine. As the atmospheric air of Europe contains but a small proportion, comparatively, of oxygene gas, the quantity taken in and fixed bears some proportion to the necessities of the system, and the balance is preserved; but in this climate, while the powers of vigorous digestion, and the proportional action of the lungs still remain unimpaired, a much greater quantity of oxygene is inspired and fixed in the blood, the irritability will be increased, and the system hyperoxygenated; hence the predisposition to fever is formed. In this climate, with Creoles, or those long settled in the country, debilitated by residence under a vertical sun, the powers of digestion, and the necessary connection between the stomach and lungs, prevent a greater assimilation of oxygene than is consistent with health; the pores of the skin are pervious, and the caloric generated is carried off by perspiration; possessed of a less firm texture of fibres than Europeans, they are not so much disposed to suffer from disease. No disease, however, from this predisposition will follow, unless some exciting cause combines, as the system will gradually accommodate itself to climate; the habit, enervated by constant heat, will no longer preserve its vigour, and no more of the oxygenous principle will be fixed than what is consistent with health, or the wants of the œconomy.

It is possible, in this climate, to preserve a degree of health unknown in the variable climates of North-America and Europe; and, accordingly, we find in the healthy islands of St. Kitts, St. Vincents, and Barbadoes, soldiers arrived from Europe, have remained there for years, and enjoyed a degree of health unknown

in any other part of the world, notwithstanding their debaucheries. Wherever the barracks are in an airy situation, and not in the neighbourhood of swamps, and the soil of the country around is loose and sandy, permitting the rain, as it falls, to percolate through, the air is cooled by plentiful rains, and is rendered more grateful and refreshing; it is only in situations where water stagnates, and vegetable putrefaction goes on, and hydrogenous gas is extricated, that the disease in question arises. I formerly remarked to Dr. Rush, before I had formed any hypothesis upon the predisposing and exciting causes of fevers, that upon Berkshire-hill, St. Vincents, the situation of the fort and barracks was to all appearance healthy, being a high ridge, surrounded mostly by the sea, and without any neighbouring swamps; but experience convinced us to the contrary; for part of the 66th regiment removed from their healthy situation upon an opposite hill, about half a mile distance, lost more of their men in a few months than the whole regiment had lost in as many years. It is necessary to remark, that this hill or ridge ended in a high peak, which it was necessary to dig down 60 feet, to give a broad base to construct the necessary buildings for defence; and two different volcanic strata, lava, pyrites, &c. separated by loam and vegetable earth, were cut through; the rain falling upon this, was probably decomposed, and hydrogene or hepatic gas afforded. I mentioned another singular circumstance to Dr. Rush, respecting the 6th regiment at Barbadoes, which was stationed at Kings-hill, a short distance from town, at the end of 1793, during the prevalence of the Yellow Fever; there was a pond of brackish water close to the barracks, and after the fever had ceased sometime, it was observed that the men were apt to be seized afresh after slight showers; the pond was covered with green moss or conservæ, and it struck me, that the rain, in falling, broke the crust, and allowed the noxious vapour to escape.

Upon the whole, therefore, I conceive that hydrogene gas is the exciting or proximate cause of fever, modified possibly by numberless external and accidental causes; and, in particular, by the state of the patient, producing the variety with which we meet; as intermittents, bilious and nervous remittents, dysenteries, &c. Wherever there is a labes in the constitution, the disease, like a treacherous enemy, attacks the weakest part; and even in the progress of the disease, if one part has suffered more than the rest, it concentrates its whole force upon that part. Hence, where there has been a retention of acrid fæces, and the gazeous oxyd of azote formed, a constriction of the surface of the body by cold or wet will produce dysentery; and, where the lungs are previously weakened, the disease will attack that organ, especially if the constitution of the air favours the attack.

I will proceed a step still further in supposition. I conjecture

that the hydrogenous and nervous gas, or fluid, are the same: possibly we may hereafter find that all the phenomena of electricity may depend upon the same principle; that the accumulation of hydrogene gas in the constitution may, in certain conditions, produce an excitement of a pleasant nature, is probable from the remarkable flow of spirits and hilarity of temper, which sometimes usher in the attack of the Yellow Fever. I suppose, also, that, like the electrical fluid, it may even be accumulated in the system without exerting its effects, until called into action by some exciting cause, whether that be contagion, the gazeous oxyd of azote, the sudden application of cold to the body; passions of the mind; bodily or mental fatigue. I suppose the effects of its accumulation, when called into action, are principally exerted upon the system of the brain and nerves; and that it is capable, by the continuance of its action, to produce in that system a state of exhaustion of the nervous influence; and a waste of oxygene. Hence, a deficiency of irritability, speedy putrefaction from that cause, dissolution of the fluids and death: hence those diseases where the nervous fluid is suddenly pumped out, terminate soonest in putrefaction; for instance, hydrophobia, tetanus, and the disease in question. Hence we might also expect to find in bodies interred, the conversion into fat from their being deprived of oxygene; hence also we may account for the sudden state of obesity after recovering from this fever.

To preserve bodies from sudden putrefaction, nothing more would appear necessary than to prevent the waste of the nervous fluid; hence the practice among fishermen of knocking on the head those salmon which they wish to crimp.

I have read Dr. Mitchill's ingenious essay upon Gazeous Oxyd of Azote, and would allow, that it has a great share, as a powerful exciting cause, in rendering the predisponent and proximate causes of fever more active; but to its being the principal agent I have strong objections. From the observations of Dr. Rush it appeared, that butchers, and those that lived in the neighbourhood of shambles, scavengers, grave-diggers, and others of similar employments, escaped the Yellow Fever in Philadelphia;* I should suppose that those people would have been more exposed to the gazeous oxyd of azote than any other class. Among sailors fed upon putrescent animal food during long voyages, we may suppose a great extrication of this air takes place; and yet fever is never produced; but a disease of an opposite tendency, viz. scurvy, marked by torpor, and a want of excitement. From all the observations I have been able to make, or to collect from the writings of authors upon this subject, it strikes me that vegetable putrefaction has a greater share in producing the disease than animal. It is well

* See Dr. Rush's Account of the Yellow Fever, pp. 101, 102.

known, that in the putrefaction of animal substances, a much greater proportion of the gazeous oxyd of azote is extricated than in vegetable putrefaction; was Dr. Mitchill's hypothesis well founded, the consequences and deductions would follow contrary to our observation.

There has been much difference of opinion among physicians respecting the contagious nature of the Yellow Fever. Some deny it altogether, and others assert that it is, in almost every instance, propagated by contagion. I must declare I have known the disease evidently propagated in this way; but, in many instances it could not be traced: I have known three cases of the fever brought on by persons bathing in the sea along side the vessel, some distance from the shore; and neglecting to dry themselves properly afterwards. The seminia of the disease were here present, and like the electrical jar charged, required only the approach of a conductor. Upon this view of the proximate cause, the plan of prevention may be easily understood, by a spare and vegetable diet, to diminish the tone and vigour of the system, and of the stomach and lungs in particular, thereby preventing the accumulation of oxygene in the system, and avoiding all occasional and debilitating causes, especially during the prevalence of the epidemic; as debauchery, night air, and exposure to the heat of the sun; by removing from the vicinity of swamps; by an open belly; and, lastly, by exchanging a low for a high situation, where the atmospheric air has less oxygene, and a greater proportion of azote. The use of the warm bath may prove salutary by opening the pores of the skin. Much might be done in preventing the accumulation of the oxygenous principle, by such articles of regimen or medicines as would fix it. The good effects of carbone, as recommended by my fellow student Dr. Odier, of Geneva, in active hæmorrhages, were probably owing to its fixing oxygene, and depriving the vascular system of its irritability.

Are we to look for the salutary effects of mercury in its taking off the irritability of the system, and preventing the expenditure (if I may say so) of the nervous fluid? or in its taking off the determination to the brain, removing the *engorgement* of that viscus, and preventing effusion, by exciting a new action of the system?

I have, in general, remarked, that while elevated situations proved health and salutary to the whites, who had removed there for the benefit of a change of air, it was far otherwise with the negroes, most of whom, in that situation, laboured under diseases of the stomach; the Cachexia Africana, or Mal d'Estomac, a disease arising from weaker excitement, or deficiency of oxygene in the blood. This is a proof, among many others, that the system, worn out by fatigue, low living, and violent, long-continued heat, requires a purer air, surcharged with oxygene, to produce the necessary excitement conducive to health.

ARTICLE IV.

CASE *of an* EXTRAORDINARY DISEASE, *in a* CHILD, *apparently* SCROPHULOUS.

By PHINEAS HEDGES, *Physician at Newburgh.*

IN October, 1791, I was called to a child, aged five years, whose mother, previous to, or during her pregnancy with him, had been afflicted with a cough, and other symptoms of a phthisis pulmonalis.

She, however, so far recovered after her delivery of this child, as to conceive again, of which also she was delivered. But shortly after her phthisical complaints increased with violence, and put an end to her existence in the year 1791. The child of which she was last delivered, in consequence of her death, was put to a dry nurse, under whose care it lingered until it was nine months old. Previous to its death, large scrophulous tumors arose on each side of its neck, of a very hard and unusual consistence: but what more immediately contributed to terminate its existence, was the pertussis, or hooping-cough, which, at that time, was very rife in the country. Although emaciated to an extreme degree, it had, at all times, a most vigorous (or rather ravenous) appetite. The pertussis appeared rather to be an auxiliary than the proximate cause of its death. Its constitution was radically infirm; and its infirmities were of such a nature as to leave no doubt that they proceeded from the mother. The emaciation was an evidence that the glands of the mesentery, as well as those of the neck, were tumified so as to prevent the absorption of the chyle by the lacteals. I am convinced, that both this child, and the one who will be the subject of this paper, inherited a scrophulous disposition from their mother. We might here inquire, first, how far the present notions of conception coincide with the notion of hereditary diseases. Secondly, how far the present doctrine of conception agrees with the pathology of the solids. If (as it is asserted) man exists in miniature in the male semen, complete in all his parts, how can a disease of the mother affect the child, except by vitiating the fluids of the fœtus, and thereby rendering them unfit to increase and support its solids? But if the placenta is a secreting or absorbing organ, secreting or absorbing the more fine and healthy part of the blood, such a consequence is not to be expected. It is asserted, that the fœtus of a mother, labouring under the venereal disease, is never contaminated with that complaint, except it come (as it must) into contact with the diseased parts of the mother in time of

delivery. I shall leave these points to be settled by speculative inquiries, and pass on to the subject of this narrative.—The child to whom I was called had been observed suddenly to halt in his gait, his abdomen to enlarge, and his spine to become crooked. At first I supposed it to be a rheumatic complaint, originating from a strain, or some accidental injury.

I, therefore, ordered a cathartic and an emplastrum roborans to his spine, expecting, in a few days, the disorder would vanish.

Shortly after I called again, and found his complaints not in the least abated. As a considerable tumefaction had taken place in his abdomen, and as his age indicated, I justly supposed him troubled with worms. To clear the way for the operation of medicines, upon his original complaint, I thought it advisable to empty his bowels of their extraneous, unnatural contents.

I therefore exhibited calomel and dianthus very successfully; after the operation of which I directed the use of iron. When under this mode of treatment, I ordered his spine to be frequently rubbed with a strong tincture of cantharides. Finding no material benefit from this procedure, I directed the part to be rubbed with spts. tereb. and to take from two to ten drops twice a day. Soon finding the inefficacy of these means, I applied to his loins a large epispastic, and ordered it to be re-applied as soon as the discharge should cease. The discharge was kept up for two or three weeks. Although the incurvation of the spine seemed, in some measure, to lessen, under the operation of epispastics, I was confident they would not be sufficiently powerful to remove a disorder of such an obstinate nature.

I therefore resorted to the exhibition of the tincture of guiacum; and, as I recollected the encomiums passed upon cream of tartar by Dr. Arbuthnot, in rheumatic cases, and as I still supposed it a rheumatic affection, I presumed the exhibition of these two medicines, in conjunction, would render them more efficacious. Accordingly I kept him under the constant use of these remedies for a month, increasing the quantity from day to day, as the system became habituated to their use. The incurvation of the spine lessenned, the tumefaction of the abdomen subsided, and appearances flattered a complete cure. But shortly, all these favourable symptoms vanished, and he was soon hurried into the same condition in which he began the use of these remedies. The subsidence of the abdomen I imputed chiefly to the use of the cream of tartar, because, it has been observed, that all saline substances have that effect upon the swollen bellies of children. They produce this effect, I presume, by dissolving the tenacious mucus which often lines the primæ viæ of children, and to which the tumefaction of their bellies may often be justly imputed.

In this instance it might have been the soluble effect of both

these substances conjoined, and no ways peculiar to the operation of the cream of tartar. Notwithstanding the retrograde appearance of the symptoms, I had determined to continue their use in a more enlarged quantity. But previous to my laying them aside, an indolent swelling had arisen in the most fleshy part of his thigh, and, at that time, began to be considerably inflamed. A suspicion arose in my mind, that the stimulant power of the guiacum would increase the pain and inflammation, especially as the swelling was large, and a considerable degree of fever had already invaded the system. The tumor had that albuminous, springy, elastic feel to the touch, which Mr. Bell considers as peculiarly characteristic of white swellings of the joints. In the appearance of this tumor I readily discovered the retrograde state of the symptoms. Being now convinced that his complaints originated from a general scrophulous diathesis, derived from his mother, I laid aside the use of all medicine, except a little volatile liniment, which I ordered to be rubbed on the tumor to amuse his friends. I, therefore, waited until suppuration took place, hoping a discharge might relieve the incurvation of his spine.

In opening the abscess, a thin, serous matter, mingled with a white curdled substance, was discharged, to the quantity of a pint. Over the orifice I applied a plaister of diachylon (as no other dressings could be confined to the part.) The wound soon put on the appearance of all scrophulous ulcers, and the incurvation of the spine rather increased than lessened. When I found the discharge did not remove his original complaint, and, I presumed, the inflammation of the tumor had subsided, I resolved to make a second attempt with the guiacum and cream of tartar. I therefore began with the quantity I had left off with, and administered it from day to day, for a considerable length of time. By its use, the belly again subsided, the crookedness of the spine seemed to diminish, although not in that degree it did under the first use of these remedies. I, however, persevered until I was fully convinced no permanent good effect could be expected, for the tumefaction of the abdomen, and the crookedness of the spine, from some hidden cause, had become as bad as when I last began the use of these remedies. I was now resolved to give him up to Nature, as I was sure his complaints were too obstinate for the present imperfect state of the healing art.

He, therefore, continued without any medical assistance, much in the situation I left him, until the winter of 1795, at which time he was seized with the hooping cough. In the interim, between the time I dismissed him and his taking the cough, a number of tumors arose, which suppurated, and were opened. From the time his first tumor arose his pulse beat with great velocity, so quick, that had I not been an eye-witness, I must have presumed,

a circulation so rapid would have worn out any constitution, and especially his, enfeebled by perpetual disease.

But, at all times, and in all circumstances, his appetite was vigorous, and, in most cases, ravenous. When attacked with the hooping-cough, he had a most violent fever, together with a discharge of blood from his lungs. The colour dark, the consistence thin, and the discharge without any mixture of phlegm. I was then confident the hæmoptysis proceeded from a rupture of blood-vessels, and that his existence would be soon terminated, either by the then raging fever, or by a succeeding phthisis pulmonalis. Neither of these events happened: for, by the assistance of epispastics and lac ammoniac, or rather by the efforts of nature, he so far recovered as to limp about as he had done before he was seized with that complaint. The evacuation of blood from his lungs must not have proceeded (as I supposed) from a rupture of vessels: for, if a rupture had taken place, we could not reasonably have presumed it to have healed when all the ulcers on the surface shewed a disposition to keep open, in spite of the means used to heal them. To the want of tension in the vessels, to a diminution of their resisting energy, and the consequent tenuity of the blood, the hæmorrhage must be referred. From the time the hooping-cough left him, until the summer of 1796, he remained in a situation very similar to what he commonly had been from the first appearance of his ulcers, his pulse rapid, and his appetite vigorous. In the beginning of the summer 1796, another large tumor appeared, near two inches distant, on the left side of his spine, about in a range with the second dorsal vertebra. It continued very painful until it suppurated, and was opened; it discharged a fluid of the same appearance as the one first mentioned. The curdly appearance, I suspect, may be imputed to a portion of the coagulable lymph effused with the serosity, or to the effusion and coagulation of the lymph, strictly so called. I shall not here enter into the investigation of this point, as it will be more properly left to the systematic.—Another tumor, soon after the opening of the last, appeared, which suppurated, and was also opened. Since that period his pulse has been very quick, his appetite still vigorous, and what is more remarkable, he voids part of his excrements from the orifice of the ulcer on his back, some from that on his abdomen, and some from the natural passage.—In the season of fruits, their seeds were often observed, in dressing his ulcers, to issue from their orifices.

And lately a number of worms have been discharged from the ulcer situate on his abdomen. A bystander will often hear wind discharged from the ulcer on his back. I introduced a probe in the ulcer of his back about one inch, in a perpendicular direction, and in that of his abdomen, two inches or better, in a slanting

direction, and I am well convinced, that the probe entered the cavity of the intestines, both from the orifice of the ulcer on his back and abdomen.

When the probe reached the spot which bounded its progress, I could sensibly perceive that the part gave way, in a manner that would naturally be expected from the thinness and looseness of the intestines. I was not able to introduce the probe in any direction so as to follow the course of the intestinal cavity. To account for this phenomenon, we must have recourse to an attachment of the intestines to the inside of the abdominal cavity. During the inflammatory state of the tumors an adhesion must have formed, and when suppuration had taken place, the retention of the discharge has given occasion to a perforation of the intestinal cavity. The pus now discharged is of the same colour and consistence with the discharge of every scrophulous ulcer. The lips of the ulcers have the same contracted, shrinking appearance; the circumjacent parts have the same livid colour; and every circumstance pertaining to his complaint evinces it to be genuinely scrophulous. To sustain such accumulated afflictions evidences a very great inherent power in the constitution: for any constitution, however robust, must give way to the following grievous symptoms, to wit, an enlarged abdomen, an incurvation, a recurvation of the spine, a perpetual discharge and a perpetual fever, except it be supported by some inherent power. Four only of the vertebræ appear to be affected. There are two prominences, one formed by the first lumbar, and the other by the tenth dorsal vertebra, both inclusive making four vertebræ. A crooked spine in infants has generally been connected by writers with a debility of the lower extremities. But the lower extremities of this patient are entirely unaffected. The incurvation of his spine seemed at first to constitute his only complaint. The crookedness of his spine is, however, most certainly to be referred to a scrophulous diathesis. It has been supposed by Mr. Pott, that the ligaments interposed between the different vertebræ of the spine were eroded, thereby rendering the motion of the spine stiff and crooked. How a scrophulous habit should produce this effect I am at a loss to determine, and still more to determine how an issue or seton should restore the eroded ligaments to their pristine state and vigour. If I was permitted to oppose conjecture to anatomical fact, (if such a fact is ascertained by dissection) I should rather impute it to affections of the ligaments, unattended with any erosion or destruction of their substance. It is true, that a loss of bone and flesh is repaired by a sort of new growth, calculated, in some measure, to perform the office of the part destroyed. But I imagine, when any intervertebral ligament has been considerably eroded, no new generation would answer the purpose of restoring the

functions of the part: an immoveable stiffness would remain. And, I imagine, physicians have been deceived when they have supposed anchyloses of the joints to be cured. They must have been instances of an inspissated synovia, rather than an erosion of the ligaments. The yolk of an egg, beat up with water, has been a frequent prescription in these cases. But can any one believe, that rubbing a knee a few times with this medicine would remove an anchylosis of that joint, proceeding from an erosion of the ligament? The friction used in making the application may have some effect in exciting the activity of the vessels, in slight stiffnesses of the joints. But that it would restore the ligament eroded, is too incredible for me to believe.

The scrophula has been treated by writers, as a complaint that always primarily affects the conglobate or lymphatic glands. On the first appearance of this tumor, I was not a little surprised, and more especially when I opened it, and found it to be of a scrophulous nature. The glands of the mesentery had undoubtedly been tumified previous to the appearance of this swelling. But no external appearance of a tumor occurring in the beginning of his complaint, gave occasion to my mistake in supposing it a rheumatic affection. And, indeed, the connection between an incurvation of the spine and the scrophula, exceeds our present pathological knowledge. From an incident that lately fell under my observation, I am led to think, that a scrophulous affection may happen without primarily affecting the glands. A boy about fourteen years of age, in good health, of a temperament indicating a scrophulous habit, was attacked with a large tumor in the fleshy part of his thigh, which continued painful and inflamed until it suppurated, broke, and discharged. The discharge resembled exactly the discharge of the patient whose situation and complaints I have thus far related: but in a short time it healed up and left the boy in as good health as it found him. In this case, no emaciation or symptom appeared, from which we could infer an obstruction or affection of the mesenteric glands. And I am led to believe, that many cases occur which cannot be referred to any primarily glandular affection.

Since I first discovered this case to be scrophulous, I have never doubted that the foundation of it was laid in his original stamina. Neither has the novel, unfounded sentiment, respecting the transmission of diseases, from parent to child, gained my assent. The circumstances pertaining to this complaint, all serve to establish the ancient opinion. And I am firmly persuaded, that an accurate and vigilant attention to circumstances will more surely lead us in the steps of truth, than consequences drawn from theoretical or analogical reasonings.

The father of this child was a most healthy man, and the mother too, previous to her pregnancy with this and the child formerly mentioned. She had three children before this, as healthy and robust as any I ever saw. My mother, previous to her marriage, was sometime affected with a cough, and her physicians and others thought she actually had a phthisis. She so far, however, recovered as to enter into the holy estate of matrimony, and bore five children; two of which died with the scrophula, one with the phthisis pulmonalis, and myself and the other surviving have been greatly afflicted with rheumatic complaints. Numerous instances have fell within my observation too notorious and circumstantial to be refuted by the reasonings of speculative theorists.

Before I close this narrative, it will be proper to mention, that this child has not grown any since the first attack of his complaint; that he has, at times, been afflicted with rheumatic pains in his limbs, and lately with the most excruciating pains in his eyes. How this disease will terminate is beyond the science of prognostics to predict, and almost beyond conjecture to imagine. That he will arrive to the age of puberty, (at which time it has been supposed the increased vigour of the solids often removes the complaint) appears to me improbable. For it does not seem likely, that the vessels, when their growth has been so long interrupted, will acquire such an additional degree of vigour as to remove the disorder and bring him to the size of manhood. And if his fibres should acquire vigour sufficient to eradicate the disease without increasing the growth, the spine will remain immoveably incurvated, and he will be a standing spectacle of human misery, and a reproachful example of medical impotency.

ARTICLE V.

As the following Case of the successful Application of Caustic to a Stricture in the Urethra tends, as far as a single Fact will go, towards settling the contested Question between two celebrated Writers (Hunter and Bell) in regard to the Propriety of that Practice, it may, perhaps, have some claim to a Place in your Repository; *if you think it will pay for its Page, it is at your Service.*

From your Friend,

VALENTINE SEAMAN.

To the Publishers of the Medical Repository.

JOHN WALL, a middle aged man, was admitted into the New-York Hospital 31st of 10th Month, (October) 1796, affected with a *fistula in perinæo*, and an almost intire *obstruction* of the natural passage of his *urine*, so that he could force out but a few drops by the urethra, the main body of the water flowing constantly and involuntarily through the opening in the perinæum.

The complaint having originated from a syphilitic affection, which he had contracted about twelve months before; and, notwithstanding he had been, as he said, under the care of different physicians since that time, whereby he most probably had every venereal taint eliminated; still, to be clear on that head, he was put under the usual mercurial remedies.

I made several attempts, and finally succeeded *once* in passing a small bougie beyond the stricture, but which I was not able to repeat. All sizes, and all the methods generally recommended, were tried, in the course of several days, to gain a second entrance beyond the obstruction, but all in vain. In this situation a choice of but two means remained, either to lay open the urethra by an incision at the place of the obstruction, so as to permit a bougie to pass it, or to endeavour to diminish the stricture by the application of caustic, as recommended by Hunter (Treat. on the Ven. Dis. part iii. chap. 2.) The former method "*being attended with so* "*much pain, and such uncertain success,*" as acknowledged by its most partial supporter (Bell), determined me in a preference for the latter: accordingly the guarded tube was carefully passed up the urethra till it met the obstruction, which was just before its curve, the plug then was withdrawn, and the caustic, properly secured in the portcrayon, introduced, and kept applied, for fear of inducing too much irritation, only forty seconds. Immediately upon the withdrawing of which the urethra was washed out by an injection of lukewarm water, previously provided for the purpose.

This operation, which did not produce any great degree of pain or irritation, was repeated every second day, for four or five times, when the patient was enabled to pass his water, in considerable quantities, by its natural outlet, and bougies, could be introduced without any difficulty.

By the constant use of the bougies, which were gradually enlarged, as his complaints would admit of, the discharge of urine by the urethra became more and more free, while that by the fistula diminished, so that in the course of a few weeks it not only intirely stopped, but the fistula itself closed up, without any application whatever to the part: and on the 15th of 12th Month, (December) he was discharged, cured of both his complaints.

ARTICLE VI.

CASE OF MANIA SUCCESSFULLY TREATED BY MERCURY.

By E. H. Smith, *Physician.*

MARY MATHEWS was admitted into the New-York Hospital August 16, 1796. She was a native of Ireland, whence she had lately come, and had been in America but a few weeks. Her person was thin, small, and delicate. She was 17 years old. The accounts given by her brothers, mother, and herself (since the restoration of her reason,) though quite incomplete, agree in representing her as having always been a feeble girl; and, as far as I can comprehend them, subject to something like hysteria—though never with that disease in the form of fit or convulsion. She describes it as a wind rising up from her stomach, a struggling for breath, a sensation like swelling of her tongue, heat in all her body, and an universal uneasiness. No more distinct information can be obtained from her relations. She was in good health, from the time of her arrival, till her present illness.

About a week previous to her being brought into the hospital, as she was walking in a field in the country, some miles from town, she was suddenly taken insane. She was carried home that day, or the next, and her symptoms continued to increase in violence till after her admission.

Her friends, who conducted her here, assured me that she had eaten nothing, nor taken any kind of nourishment for a week. Notwithstanding, her efforts were so violent, that it was necessary to cause her to be confined in a cell, and to be strait-waistcoated. In all this week nothing had passed her bowels; but she voided urine as in health. Repeated and careful attempts were made, and for near an hour in my presence, to administer food, with no effect. It was forced into her mouth, but instantly rejected. The same was the case with the purgative powders which were directed: and no exertion, proper to be made, was equal to the injection of a clyster.

Between the mornings of the 16th and 18th, the patient completely tore off and rent apart three strait-waistcoats; neither of which, probably, could have been rent by the utmost combined efforts of two strong men. In one instance, after freeing her arm, she forced off the grating of her cell, leapt into and ran across the yard, jumped into the washing-room, and drank some dirty suds.

This was the first thing she had been known to swallow since her disease commenced. Five or six persons were, with difficulty, able to force her back to her cell.

As it was impossible to keep her covered, she went naked. Of the indecency of her nakedness she appeared to have no idea, for she took no pains to conceal it. She disposed herself in various and scarcely conceivable attitudes; and continued, for hours, in postures which well persons could not have assumed, much less have rested in. Meanwhile, she noticed no person, not even her mother or brothers; but divided her time in singing methodistic hymns, and putting up short prayers. Yet her insanity did not appear to have any connection with religious ideas, further than the repetition of these verses and prayers,—to which she had probably been accustomed from her infancy, and now repeated like any thing else strongly fixed on the memory. That her disease did not proceed from any insane religious impression is evident from her never having expressed any anxiety before, during, or after her illness. Nor did she seem to suffer from apprehension of any kind. Her only uniform exertion, beside that which has been noticed, was to escape, when the door of the cell was opened. But she shewed no uneasiness to effect this, when it was shut; nor did she, at such times, nor at any time, endeavour to hurt her attendants and visitants. No artifice of theirs could engage her attention.

August 18th. She had now been eight or nine days without food, and without a motion of the bowels; during which time she had taken no sleep nor repose, and the violence of her efforts, in singing, &c. was not sensibly diminished. As the vital energy seemed principally determined to the external muscles, leaving the stomach and intestinal canal, in particular, in a state of apparent torpidity, it occurred to me that, notwithstanding her long inanition and violent exertions, any thing which would considerably diminish the muscular force would tend to equalize the distribution of that energy, and would promote a cure. I was, therefore, desirous of bleeding her. But it was impossible to use the lancet. She bent her arm; and no force could open, and preserve it steadily unbent. We had recourse to the cupping-glasses, which were applied to the occiput, temples, and forehead; and about six ounces of *black blood* taken away. After this she was more calm, for some hours, and willingly took about a jill of broth or gruel, that was offered her. From an expectation that she would continue in her present state, and an apprehension that the sudden use of much food would injure her, the nurse gave her no more at that time, and even neglected to administer the purging powders that had been directed. The patient soon relapsed into all her violence, and opposition to food; and would take only some

cold water, which she craved, and which caused her to vomit. She threw up only the water.

On the 20th, the cupping was ordered to be repeated; but, from various delays, was not performed till the 22d; when a small quantity of blood was taken away, with no other effect than to make the patient faint.

23d. No material alteration. She has taken no food; has not slept; and, though her efforts are as constant as ever, her strength is very much diminished. I resolved to try the effect of salivation; hoping that if I could succeed in exciting a powerful action in the absorbent system, it would divert a part of the vital energy from the muscles, and awaken the torpid power of the brain, stomach and bowels. Three drachms of strong mercurial ointment were accordingly rubbed in by the morning of the

24th. And her gums were now slightly affected. As this soreness of the mouth came on and increased, she grew calm and rational: took food, purging powders of jalap and calomel, and an injection. She also had her cloaths put on, and was removed on to a clean bed, in the nurse's room. The mercurial friction was discontinued.

This interval of reason was only of a few hours. She became as violent as ever; broke every frangible article in the nurse's apartment; and again tore off her cloaths. She was re-conducted to the cell. The same evening her cathartic operated freely, and brought off large masses of dark and hardened excrement.

25th. The mecurial frictions were renewed. They excited a gentle salivation, and brought back her reason.

26th. This day she was removed into the principal ward for women, and proper medicines and regimen were directed for the restoration of her strength, which was very much impaired. For several days she continued to be exercised with occasional turns of anxiety and distress, such as accompanied the recurrence of her original complaint, after the first interval. These were particularly troublesome about two o'clock in the afternoon, when there was increase of heat, and in the frequency of the pulse. But she mended gradually till the 7th of September, when she was well enough to return to her family. Several months after she applied to the hospital for some trifling complaint, for which the physician in attendance did not think proper to admit her; but she had not then suffered any relapse into insanity.

After the recovery of this patient, she said that she was sensible of her nakedness at the time, of the cupping, and some other circumstances. She attributed her conduct to witchcraft, or something of the kind, which made the wind in her stomach, that she used to complain of, ascend into her head; and she said the heat of her body was so intolerable that she could not endure the

least covering. But her extreme ignorance embarrassed her account so much, that it was difficult to determine precisely what she meant, and how much she might be depended on.—Her skin was never remarkably hot during her insanity; but after the return of her reason, her feet were affected with such a burning heat, that they could only be relieved by placing them in cold water; and she was troubled with irregular flushes, over her whole body, for several days.

I FEEL a greater interest in making the foregoing case public, as, since it came under my care, I have learnt that an insane person, who refused food, starved to death. The facts here related may, at least, suggest a probable resource against an event so melancholy to the friends of the sufferer.

With respect to the disease of Mary Mathews, which I have called *mania*, it may perhaps be questionable whether it has been denominated so with propriety.—It deserves to be remembered, that the whole duration of her illness, as near as we can determine, was fourteen or fifteen days. Is it possible that this was its period, that it then ceased, from having completed its course, or that it was more easily inclined to stop at that time than another? Is it possible that this is a variety of hysteria?—of intermitting fever, which sometimes assumes the shape of mania, and to which the quotidian exacerbations, after the insanity was removed, may be supposed to correspond? Or, is it possible that the cause of Yellow Fever, whatever it may be, which, in different persons, affects different parts of the system, and appears under almost every form of disease, to whose operation foreigners seem peculiarly liable, and were so this year, could have excited the mania of this girl, whose period is that of many fevers, and whose cure, supposing it to have been effected by the salivation, is not hostile to the supposition?

The reader must determine which, or whether any of these conjectures deserve consideration.

ARTICLE VII.

Further Facts tending towards an Explanation of the true Operation of ALKALIS *and* LIME *upon other Substances.*

In a Letter from Dr. MITCHILL *to* THOMAS BEDDOES, *M. D. dated New-York, September* 15, 1797.

WHAT I wrote to Dr. Percival on the 17th of January, 1797, was an attempt to reduce the phenomena of alkaline remedies and neutral salts, in febrile distempers, to a general principle, by shewing how they overcame or expelled the putrid miasmata, or the contagion which induced the symptoms. Since that time, when, in the spring of the present year, it was agitated among the citizens of New-York, whether manufactories of soap and candles generated pestilential air, the facts which presented themselves to my view led to a conviction, that calcarious earths, alkaline salts, animal fats, and vegetable oils, attracted the matter which imparted to the atmosphere its epidemic and sickly influence, and consequently neutralized or deadened the septic effluvia which were the cause of fevers. (Case of the manufactures, &c. stated and examined.) And more recently still, on considering these noxious exhalations, in relation to soils, manures, and vegetation, it seemed obvious, that lime and alkalis could repress them; and, by so doing, did purify the air and fertilize the land; and were thus serviceable in agriculture, not by any septic influence they possessed, but, in a considerable degree, by neutralizing the septic (nitric) acid, or acid of putrefaction. (Medical Repository, p. 39.) Indeed, the united force of the facts afforded by the materia medica, by arts and trades, and by agriculture, prevailed over all the former notions I possessed; and, as I believed, did exhibit in evidence too strong to be resisted, that the principle I had laid down was grounded upon a very broad induction of facts.

Besides the considerations alluded to, my opinion of the power of lime to absorb, and, in some degree, to neutralize the fluids produced by putrefying animal substances, was strengthened by reading GRAYDON's paper concerning the fishes inclosed in the limestone of Monte Bolca, near Verona. (5 Trans. of the Royal Irish Academy, p. 281.) Here is a mass, or part of a stratum of calcarious rock, which contains, not the mere impressions or likenesses of animals, as shistic fossils commonly do, nor *petrifactions* of them, as is generally the case with calcarious rocks, BUT THE ACTUAL REMAINS OF DEAD FISHES, of their natural size and

figure, PRESERVED LIKE MUMMIES, and so complete that their genera and species can be perfectly ascertained. The lime, in this case, is penetrated by animal matter, which seems to have imparted to it the quality of emitting a fœtid and unpleasant smell when scraped or struck. No analysis that I know of has been made of the rock: but among the matters with which it is charged are evidently these:—whatever of fixed air has been formed by the union of oxygene with carbone, during the putrefaction of the fishes, has been attracted by the calcarious matter, and consolidated with it; the whole of the water produced by the junction of their oxygene with hydrogene, has been absorbed by the porous earth; all the oil formed by the union of their hydrogene with carbone, has been drunk up in the same way; and the septic acid, formed by the combination of their azote with oxygene, has likewise become embodied with the surrounding lime. Thus, as fast as any thing fluid was formed, it was immediately imbibed; and as the fluids formed by putrefaction are thus combined with the calcarious stone, the residuary matter of the animals is left in a dry and somewhat firm condition, resembling mummies; the lime having had, as it were, an embalming effect, or, at most, having literally acted the part of a sarcophagus. In particular, it may be considered, that the total decay of the bodies of the fishes was prevented by the absorption of the water and septic acid produced during the first stages of corruption.

Yet this preserving power of lime is not peculiar to it, for it belongs to alkalis too. DEAN HAMILTON's experiments on the power of the *fixed*, *caustic*, *alkaline salts*, to preserve the flesh of animals from putrefaction (ibid. p. 319) are sufficient of themselves to correct many of the mistakes we labour under in respect to alkaline salts and putrefying bodies. They shew that caustic pot-ash possesses a power of preserving animal flesh from corruption, fully as remarkable as the antiseptic power of caustic lime. It preserves flesh incorruptible, though it has been generally believed caustic alkalis would consume it. Flesh preserved in this way is so durable, that after twenty-two years keeping it remained unaltered, when broken, the parts hung together by fibres, and looked like a piece of plaister taken from a wall; the fibrous or stringy parts of the flesh not seeming to have been corroded or dissolved by the salt.

The strong *antiseptic* powers, possessed in so high a degree both by quick-lime and caustic alkalis, must induce a change of opinion relative to their effects upon the dead parts of animals. They are antiseptics, and particularly so, for this reason, among others, that they attach and neutralize that great destroyer of organized bodies, the septic acid.

Such a change of opinion would probably have happened long

ago, if the leading medical characters in Great-Britain had attended to a hint of the Italian LANCISI, and improved upon it. This attentive observer of the noxious exhalations of the marshes around Rome, entertained no doubt of the efficacy of *quick-lime* and soda to correct pestilential miasmata, "*non enim dubitamus*," he writes treating of the tanning of leather, *quin lixivium ex viva calce paratum et pulvis myrti et sodæ, quibus pelles absterguntur et condiuntur*, PESTIFERUM MIASMA POSSUNT CORRIGERE (De bovilla peste, par. ii. cap. 2). It is strange that the effects of lime-water, employed in tanning, to preserve the hides from putrefaction, has not been more attended to by philosophical inquirers. And it is no less strange that the power of lime, to destroy putrid vapour (septic acid,) if any should be formed, during the preparation of the skins, and thereby prevent the business from growing unhealthy, has been almost intirely overlooked, though the facts are so plain and palpable. The antiseptic operation of lime keeps the pelts from turning to pestilential air, and instantly attracts to itself every particle of it, if any should be formed. It exercises a like power upon water put into casks for mariners' use at sea. The good effects of lime-water in putrid scurvies, and some other diseases, to which seamen are liable, have been so evident, that ALSTON, in 1752, under a conviction of its beneficial tendency, recommended one pound of fresh, well burned quick-lime, to be put into a hogshead of water, and to be used as common drink by the diseased, and by way of prevention for the healthy; (Dissertation on Quick-lime and Lime-water)—and also to put some of it in the ship's well, to prevent the putrid steams and foul air rising from thence. (Lind on the Scurvy, p. 442).

The disposition of lime to preserve animal substances is further evinced by the incrustations and petrifactions so plentifully to be found in caves and quarries of calcarious earth, and so frequently seen in the collections of the curious. All nature is full of this kind of evidence. There is, therefore, no necessity of mentioning, in detail, the petrified serpents, toads, and almost all sorts of creatures, that have been found embalmed in lime-stone.

But, though alkalis are such great resisters of putrefaction in carcases or their parts, caustic pot-ash produces some effects upon the living human body, which are not generally known. By attending to them, it will appear, this latter may destroy life, though not by inducing any form of malignant or pestilential disorder. Pursuant to the law which provides for the inspection of pot-ash and pearl-ash in the city of New-York, large quantities of those articles are deposited in the store-houses of the persons appointed by the government to examine them. The quantity of these salts is so great that the inspectors are obliged to employ frequently several men to assist them, in the capacity of clerks and labourers. In order to

make a complete inspection of the alkalis, it has been oftentimes judged necessary to empty the barrels in whole or in part. During this operation, it generally happened that some of the materials flew about in the form of dry powder, and passed with the air into the nostrils, mouth, throat and lungs of the bystanders. The effects of the inhaled powder of caustic pot-ash are well worthy to be noted. One of the inspectors ascribed to it the purity and soundness of his teeth, and relief from the sensation formerly caused by an acid in his stomach. His decaying teeth ceased to rot any more since he applied pot-ash to them. But much more serious was its operation upon the steady labourers. Sneezing, coughing, and impeded respiration were among the first of its effects. Spitting of blood sometimes came on afterwards. The lungs, if still exposed to the saline dust, became more and more disordered, the strength diminished, and, as the disease increased, the persons were affected as with a sort of consumption, and died. The death of a number of men that had worked in the pot-ash stores is thus accounted for by the inspectors. It has been common to have a considerable part of the work done by slaves; for free labourers, who are acquainted with the nature of the business, engage in it reluctantly, and many of them altogether refuse to work at it. Apprehensive of the danger which arises from starting all the contents of every barrel upon the floor, the inspectors have been reduced to the necessity of discontinuing this part of the practice in some degree. These caustic alkaline atoms, when they are inhaled and dissolved in the mucus of the passages, are thus productive of a lingering indisposition, in which the lungs particularly suffer; but they have never been known to excite yellow fever, or any set of symptoms that resemble it: so far is this from being the case, that during that epidemic sickness which has so often visited the city of New-York, I could discover no instance of the inspectors and their assistants having hitherto been infected by it.

The information you gave me in your letter from Clifton, of June 15, concerning the cure of diabetes mellitus by hepatized ammonia, or by volatile alkali alone, is very interesting. In addition to the plan I suggest the propriety of prescribing lime in preference to ammoniac. The reason of my hint is this: It is said at Schoharie, in the state of New-York, that in that part of the country, where much sugar and molasses is made from the juice of the maple tree, (acer saccharinum) and used plentifully by the inhabitants, diabetes is a frequent disorder. To get relief from the complaint, it is a common practice to take astringents, and that the drinking plentifully of *lime-water* in addition to them, often wrought a cure. This fact leads to a little speculation. The sugar-making process is familiar to many plants. Diabetes seems a sugar-making operation going on in animals, and to be in them a

formidable disease. The benefit derived from lime leads to a suspicion of the presence of the oxalic acid. The Scholarie people are cured by lime, and this probably acts by neutralizing the acid of sugar, and checking that morbid action of the vessels which favours the saccharine secretion in men. Now, from the known stronger attraction of lime for oxalic acid than ammoniac or other alkalis possess, is there not a good reason for preferring it? I wish you would mention it to Dr. Rollo.

The fact now related is connected with another still more important. The part of the country alluded to is underlaid with limestone and calcarious marle, and is remarkable for its freedom from epidemic, intermittent, malignant, and pestilential fevers. This appears to be the case in Tensesee, Kentucky, and all our Western Country, where lime constitutes extensive strata. These disorders, when they break out, happen sporadically from an improper state of the alimentary canal, bad management about the house, or some such cause. But the universal spread of such distempers among the people is prevented by the lime, which attracts and neutralizes the septic and pestilential vapours, turning with them to calcarious nitre, fertilizing the soil, and rendering the settlements there friendly at once to animal and vegetable life. The lime with which the water is charged, has, when drank, a like operation on the contents of the stomach and bowels.

In order to illustrate the effects of alkaline substances on the acid of septon, I have summed up my ideas in the following verses, which I send along for your amusement.

THE DOCTRINE OF SEPTON.

Attempted after the Mannner of Dr. DARWIN.

Putrefaction of animal and vegetable substances.

GNOMES! you beheld, with pity and with pain,
Organic relics strew the fertile plain:—
Whatever Forms, with vital warmth endued,
Lords of the earth, or tenants of the flood;
That sport, or bask them, in etherial day,
Or wind their humble, mine their darksome way;—
Of juicy herb, gay flower, and piercing root,
With scent ambrosial, or hesperian fruit;—
Subdued by Death, whose fury nothing spares,
Turn back to *Earths*, or change again to *Airs*.

Excitability, stimulus, excitement, & exhaustion.

YOU saw where embryo germs to being start,
The brain almost coeval with the heart:
YOU viewed, no less a miracle indeed,
The pre-existing plantule in the seed:

Saw their nice organs, ere the natal hour,
Acquire a portion of *sensorial power;*
Alike appear with *irritation* fill'd,
As *stimulus* along their fibres thrill'd;
Excitement springing from this mutual strife,
To sense and action wake unfeeling life;
Till, aged grown, the *exhausted* fabric drops,
Each function fails, and every motion stops.

Oxygen, *the principle of* excitability; sepion, *the principle of* diffolution.

Man's constitution thus full well YE knew,
From OXYGEN its life and vigour drew;
Whence tinctur'd all its grosser parts refine,
By fire promethean, energy divine;
YOU saw, with wondering eyes and rare-drawn breath,
Infus'd the peccant principle of death;
Grim SEPTON, arm'd with power to intervene,
And disconnect the animal machine;
In our first Parents' breast, the fiend Dismay,
And cherub Hope, contending for the sway:—
With like affright, astonish'd NATURE saw
Giants earth-born dispute celestial law,
TITANIAN POWERS defy the GODS above,
And fierce BRIAREUS dare the throne of JOVE;—
Thus fair CREATION, almost burst in twain,
When PAN, incens'd, disputed EROS' reign;—
So HERCULES had nearly swerv'd from truth,
When VICE from VIRTUE sought to tear the YOUTH;
Hence MANICHEES, by twilight Reason view'd,
Two self-existent Powers, the *Evil* and the *Good.*—

Effects of septon *and its* compounds, *on the* mind *and* body, *in* producing diseases.

Within the great DISORGANIZER lurks,
And plans, unseen, his undermining works;
Insidious, first, with onset mild assails,
Till *sluggishness* or *unconcern* prevails;
Then, mustering thick his fierce *azotic bands,*
More near, the citadel of life commands;
With phalanx firm, the unconscious prey surrounds,
And deep inflicts his unsuspected wounds:
Beneath their blows the sinking powers decay;
The feet with painful effort trace their way;
The feeble arm irresolutely lies;
A dim suffusion clouds the heavy eyes;
Heroic vigour asks a little rest;
And the high purpose slumbers in the breast.
Next, bolder grown, the *Tyrant,* with a frown,
Bids SCURVY break the blood and vessels down;

LEPRA and SERPIGO attacks begin,
And SORES and BLOTCHES desolate the skin;
Shews greedy CANCER how he best may thrive,
And gorge and feast on human flesh alive;
Tells FEVER, as in ambuscade he lies,
An hundred ways to take us by surprize;
To INTERMITTENT, PLAGUE and HECTIC joins,
And CAUSOS, TYPHUS, SYNOCHA combines;
Possessing each, and all, as war they wage,
Sporadic force or *epidemic* rage:—
—Thus, when of old, as pious men believe,
The SERPENT whisper'd in the ear of EVE,
The subtle fiend a fit occasion sought,
With hellish guile, to poison human thought;
With winning speech seduced her easy faith,
And gave the fruit of knowledge, but of death:—
No more the paths of *Innocence* she trod,
But, *disobedient*, turned away from God;
And felt, sad recompence of duty broke,
Vengeful *Remorse*, thy deep and deadly stroke:—
Hence *Pain*, hence *Sin*, their wasteful course began;
Thro' all her offspring vile corruption ran;
And Man, deprav'd, to *vice* and *error* hurl'd,
Still proves the *Septon* of the *moral world*.

Analogy between septon *in the* natural, *and* evil *in the* moral *world.*

GNOMES! you descry, with keen, lyncean eyes,
The foul *mephitic vapours* as they rise;
Stand by while captivating SEPTON draws
Unwary OXYGEN to aid his cause;—
—Thus JUNO's charms, entranc'd, the thunderer held,
While her lov'd Grecians claim'd the bloody field;—
—Their *silent* union gives the MONSTER birth,
Who wastes with *septic fury* half the earth;—
—Embrac'd by TITAN, thus, in days of yore,
The fifty-handed giant TERRA bore;
With like destruction, on the ARGIVE TRAINS,
The DELIAN PAIR aveng'd their priestess' chains.—
GNOMES! your quick steps HIS subtle flight pursue,
And hold the many-changing FIEND in view;
YOUR guardian cares his secret arts betray;
YOU ope his dark recesses to the day;
YOU mark his conquests o'er the leafy race;
'Mid haunts of men his treacherous foot-steps trace;
In varying shapes, as best he loves to pass,
Of *heavier acid* or of *lighter gas;*

Production of pestilential fluids, *by the union of* septon *with* oxygene.

In all the same, with one base passion fir'd,
In every form, by hate to man inspir'd;
Whose days abridged, in solemn warnings shew,
Life brief in pleasure, still too long in woe.—

Operation of calcarious earths, alkaline salts, oily substances, clay, &c. in attracting pestilential airs.

GNOMES! to impede the DEMON's deadly course,
YOUR BANDS CELESTIAL marshall'd all their force:
From watery caves where shelly nations sleep,
From sinuous bays, from Ocean's briny deep,
YOUR hands collecting spread thro' every clime,
A fair proportion of attempering LIME;
Thro' all the space terrestrial Nature owns,
Of Climates, Colures, Longitudes and Zones,
YOUR search the powerful ALKALIS has found,
And cast, the Earth's circumference around;
The friendly powers of METAL, OIL and CLAY,
With duteous zeal your just commands obey;
With wise dispatch their various stations gain,
And guard the Mine, the Mountain, and the Plain.—

Marsh miasmata, &c. YET UNSUBDUED.

——The conflict o'er, behold on all sides round,
In *neutral* chains, the Powers of Mischief bound;
To lie, unless a rescuing force appears,
In durance strict, ten thousand thousand years;
Except where *swamps* their reinforcements yield,
And light detachments skirmish o'er the field.

Deflagration of salt-petre, *the acid destroyed, and the alkali remaining behind.*

YOU saw, ye GNOMES! before this day was won,
Prodigious feats of Chemic valour done;—
YOU saw POTASSA seize a *Septic* foe,
His brawny arms around unclenching throw;
Then, plung'd in flames, as shuddering hosts admire,
Himself unhurt, consume the wretch by fire:—

Use of calcarious nitre *for manure.*

—YOU saw where CALX a *nitric* miscreant found,
And grip'd, and pull'd, and dragg'd him to the ground;
And there expos'd him, suffering day by day,
To hungry plants a sweet and wholesome prey:—

Combustion of oil by septous acid, *& their mutual decomposition*

—YOU saw, that time, terrific anger boil,
When AQUA-FORTIS met with HEATED OIL;—
Both vanquish'd, falling underneath the shock,
Expir'd in blaze and suffocating smoke.—

I might go on to a greater length with this kind of writing, if I had not already violated the poetical precept, "*Non fumum ex ful-*

gore;" therefore the sample you have now got must suffice at this time. From the gaiety of verse, I return to the gravity of prose.

On a survey of the economy of nature, in respect to alkalis and acids, it appears, that, considering the great number of acidifiable bases, and the combination of these in such a vast number of cases with oxygene, acids would predominate and get the upper hand in creation, unless alkaline substances overpowered them, and prepared them for more ready decomposition by vegetation and other operations. Thus the *carbonic* and *septic* acids which are afforded most plentifully during many putrefactive processes, are not only neutralized by lime, pot-ash, and soda, but in these forms are duly prepared for decomposition by plants, which, on finding the carbonates and septites of either of those substances in the soil, will take as much carbone, septon and oxygene, and of the earthy and saline bases with which they were blended, as the wants of their constitutions respectively require. And in doing this the health and life of animals are protected against the dangerous attacks of that redundant acidity, which would otherwise prevail and destroy the balance of powers in the natural world.

In hope of great additional good to be derived from your exertions to establish pneumatic medicine, I conclude, but not without assuring you, that, &c. &c.

SAMUEL L. MITCHILL.

ARTICLE VIII.

ON THE EFFECTS OF ABSTINENCE AT THE APPROACH OF ACUTE DISEASES.

By EDWARD MILLER, *M. D.*

THE following fact seems to deserve more attention than it commonly obtains.—In a district of the United States, distinguished for the prevalence of the epidemic diseases of summer and autumn, it is often asserted, by sensible and accurate observers, that they are accustomed to obviate the attack of fevers, apparently approaching, by rigid abstinence from food. This abstinence, begun as soon as they perceive the feelings of indisposition, usually known to be the forerunners of fever, is continued till such feelings cease, till appetite is restored, and generally, indeed, till the calls of hunger become importunate. On different occasions, this process is of various duration; sometimes occupying twenty-four, thirty-six, or even forty-eight hours, according to the nature and exigencies of the case. The success of this regimen is commended by such as have experienced it, in stronger terms than it would be proper here to repeat, and, perhaps, stronger than the reality of the case can justify. It is not, however, difficult to perceive that much fallacy may be mingled with this sort of experience. Complaints, similar to these in question, are often transient, when every attention to regimen has been omitted. What criterion then shall be resorted to, for the purpose of distinguishing these fugitive symptoms, originating from indigestion or some still more fleeting cause, from the serious ones, which, if neglected, will usher in a severe disease? This ground of uncertainty is freely admitted. But still it remains probable, that there is much truth in the observation, particularly when we call to mind the number, sagacity, and concurrence of the observers, the accuracy of personal experience, and the multiplied instances which epidemic sickness affords for comparison and discrimination. And I am further inclined to give credit to this observation, because it appears to depend upon principles of the animal economy, which are of great importance, and admit of an easy explanation.

Although the observation above-mentioned comes, in the present instance, from a popular source, the effects of abstinence, in obviating the approach of acute diseases, have not escaped the notice of the most eminent physicians. In the writings of Hippocrates we perceive the strong impression he had received on the subject.

Sydenham is still more explicit. In his account of the continued fever of the years 1673, 1674, and 1675, considered by Dr. Cullen as a variety of synocha, or inflammatory fever, it is asserted that he often cured this, as well as other sorts of fevers, in the beginning, merely by directing diluents, and prohibiting every kind of aliment. Thus he relieved his children and intimate friends (to use his own words) *by making them fast strictly for two or three days*.—And, besides medical authority, we may also adduce, in favour of this mode of preventing diseases, the recommendation and practice of many men of letters, who have adopted it with the greatest zeal. The sedentary lives of such persons, diminishing keenness of appetite, and augmenting the burden of repletion, and their experience of higher intellectual power in a somewhat diminished degree of bodily vigour, may, perhaps, account for their attachment to this remedy.*

The advantages of total abstinence, at the commencement of acute diseases, bear an evident relation to the effects of a temperate and abstemious diet, during the prevalence of fatal epidemics. The long experience of countries subject to the visitation of pestilential diseases, and of several parts of our own country, under the pressure of recent or existing calamities of a similar kind, places the benefits of this diet in a strong light. Not only the caution of individuals, but the habits of nations may be distinguished

* Among many examples of literary persons, who have practised rigid abstinence, and derived great benefit from it, I shall mention the late Rev. Dr. Campbell, Principal of Marischal College and the University of Aberdeen, who died in 1795, aged 71 years. "He had, all his life, a rooted "aversion to medicines. He got the better of every ailment, by a total "and rigorous abstinence from all kind of sustenance whatever; and it was "not till he was attacked by an alarming illness, about two years before his "death, that he was persuaded by his friends to call in medical aid. What "nature could do, she had all along performed well; but her day was over, "and something of art became necessary.—Then, for the first time, he own-"ed the utility of medical men, and declared his recantation of the very "mean opinion he had formerly entertained of them and their art."—Monthly Mag. vol. i. p. 344.

Whatever mistakes may appear in such opinions, it is interesting, in all the concerns of health and diseases, where facts and the unbiassed examination of them are so important, to observe the conclusions formed by discerning men, who are, at the same time, divested of the prejudices incidental to the medical profession. While, on the one hand, physicians possess superior advantages in acquiring knowledge of the nature and cure of diseases, on the other, they are peculiarly exposed to certain sources of error. Systems collect, combine, generalize and interpret facts; but they also, sometimes, distort and mutilate them. Hence the common sense of mankind, and more especially the discernment of vigorous minds, is a necessary corrective of that obliquity with which even simple objects are sometimes beheld by the systematical devotee.

in the comparative exemption from diseases, which they derive from abstemiousness. The French and Spaniards in the West-Indies, and in other warm climates, avoiding the use of ardent liquors, and retaining their usual habits of thin and spare diet, are observed remarkably to escape the dangers incidental to such situations; while the British, carrying with them, wherever they go, not only their plethoric and vigorous habits, but likewise their national predilection for a gross and stimulant plan of living, suffer all the havoc of those baneful countries. From every tropical region similar examples might be brought; and wherever experience has enforced accommodation to the inclemency of a hot climate, we observe people relinquishing all such excesses and grossnesses of diet as can only be safely indulged in the higher latitudes.

The importance of the functions of the stomach in the animal system explains the powerful effects of abstinence and repletion. No animal can exist without a stomach. Deprived of brain, heart and lungs, the cold-blooded animals have been observed to live and move for several hours. The languor of their circulation, their occasional exercise of respiration, and a portion of excitability singularly inherent and inseparable, enable them, while the energies of the stomach continue, to retain life without the aid of those important organs. And, even in the more perfect animals, the functions of the stomach hold so distinguished a rank, that life has remained for some time independently of almost every other part of the body. The range of sympathy which it possesses with other parts, remote as well as contiguous, is so extensive, that it is emphatically stiled the index of the whole system. Besides its importance as the principal organ of assimilation, we observe a great number and variety of effects, salutary, morbid or deleterious, produced by different substances taken into it, and operating on its sensible and delicate texture. In febrile diseases it affords some of the most interesting and satisfactory indications concerning their accession, progress, remission, crisis, and cure.* And, finally, it possesses a mobility, or, in other words, a promptitude to suffer more defect or excess of excitement than any other part of the system.—Such is the organ—such the powerful changes in it, and thence in the whole system, which we propose to excite by occasionally depriving it of the accustomed stimulus of aliment.

Acute diseases invade the body in various ways; sometimes suddenly; oftener by gradual approach: when sudddenly, they admit not of prevention by abstinence. It is probable much more may be learned by future observation than is at present known, concerning the distant approach of these diseases, and, consequently, the means of averting the danger they produce. In

* Medical Commentaries, vol. xviii. p. 94.

the meantime, it would be fortunate for mankind if they were disposed to avail themselves of all the notices of approaching illness already well understood. During the prevalence of epidemic diseases, these symptoms should be watched with especial attention; as, upon the proper management of the interval between them and the actual formation of the disease, the prevention of the evil, and the safety of the patient will often depend.

It would be no easy task, nor is it necessary to point out all the symptoms which notify the approach of acute diseases. There seems to be so much reason to ascribe indicial functions to the stomach, that we should generally look to that viscus for the earliest notices of impending mischief. Accordingly some accurate observers mention a peculiar, disagreeable affection of the stomach, difficult distinctly to describe, compounded of nausea and anxiety, as the first morbid sensation. Then follow heaviness, lassitude, languor, debility, oppression, restlessness, head-ach, or giddiness, pain in the back or limbs, perversion of taste, flatulency, irregularity of the intestinal discharge, loss of appetite, or sometimes great keenness of it, low spirits or unusual vivacity, wakefulness or unusually sound sleep.* When such symptoms as these occur, during the prevalence of an epidemic disorder, or after exposure to any of the known causes of acute diseases, it will be advisable to abstain from all aliment for a proper length of time, and if this step should be found unavailing, to adopt such farther measures as the nature of the case may require.

Sensations which precede the invasion of acute diseases, it is well known, are often mistaken for symptoms of indigestion, and treated accordingly. The mischief that must ensue from the use of ardent spirits, the popular remedy of indigestion, at the approach of a malignant fever, or any inflammatory disease, will be readily seen.

All alimentary matter, especially of the animal kind, taken at the commencement of an acute disease, is fraught with mischievous consequences. The powers of digestion are either impaired or totally suspended. No assimilation nor nourishment can take place. The stimulus of the food, immediately on its arrival at the stomach, will be added to the morbid stimuli, previously operating with pernicious violence. Tottering under its present load, the system is forced to sustain new burdens. But this is not the only bad effect of receiving food under such circumstances. The alimentary matter, unsubdued and unassimilated by the powers of digestion, placed in a situation where it must undergo a rapid and noxious decomposition, will form a mass of corruption and acri-

* The ſtimulus of contagion or miaſma, in certain degrees of force, may evidently produce exhilarating and ſoporific effects.

mony, generating and diffusing its poison throughout the whole tract of the stomach and bowels. Can we wonder, after this, to hear complaints of flatulency, oppression and anxiety about the præcordia, pains in the bowels, diarrhœa, &c. in the course of the disease?

Having thus stated some of the ill consequences of food received into the stomach at the commencement of acute diseases, it becomes necessary to avoid these consequences by abstinence or evacuations. Much has been said, by practical writers, on the efficacy of emetics, exhibited at the approach of malignant fevers; and there is reason to assent, in general, to the truth of these assertions. But, we believe, that abstinence may often be advantageously substituted for emetics or other evacuants in such cases, and as their effects correspond in several particulars, and seem to throw light on each other, we shall venture to consider them in a comparative point of view.

Emetics produce the following effects—they empty the stomach and the upper intestines—they accumulate excitability in these organs*—they increase the action of the cellular, pulmonary and cutaneous absorbents—and they promote perspiration.†

It will not, I conceive, be difficult to demonstrate that abstinence produces effects nearly similar. That emptiness is one of its consequences, must be too obvious to require proof or illustration—and that excitability is accumulated by withdrawing, for a time, from any part of the living body its accustomed stimulus, is likewise a fact too plain and simple to be denied. When food and drink are withheld, no person will doubt that the action of the lacteal and lymphatic absorbents of the stomach and bowels is proportionably diminished; and it appears to be a law of the animal

* That emetics accumulate excitability, is proved by their often stopping spontaneous vomiting, by their strengthening digestion, and by increasing the action of the cellular, cutaneous, and pulmonary absorbents, during their operation. Zoonomia, vol. ii. p. 57.

† There are, indeed, other considerable effects of emetics, such as agitation and compression of the abdominal and thoracic viscera, thereby increasing the force of circulation in them, and promoting their several secretions. But these effects appear to hold but little importance in preventing the attack of fevers.—Dr. Darwin, "in his theory of fever, supposes that emetics, "early administered, sometimes cut short the disease, by causing a retrograde "motion of the lacteals, and a consequent diminution of the matter of con-"tagion. Few explanations in his work are of so gross and mechanical a "cast. We conjecture that the blow must be given to the stomach before "the subtile matter is absorbed by the lacteals: we should not be surprized "if these vessels were rendered incapable of action: and does it not appear "more consonant to other parts of the author's reasoning, to suppose that "vomits, in these instances, counteract the exhausting effect of the poison, "by accumulating the sensorial power of the organ?" See Analytical Review for Feb. 1797, p. 139.

economy, that any diminution of the action of these branches of the absorbent system will be compensated by a correspondent increase of energy in the cellular, pulmonary, cutaneous, and other absorbents. Proofs of this fact might easily be multiplied. The effect of *fasting* in exciting a very copious discharge of urine, in dropsy, exemplified in the case of the celebrated Dr. Johnson,* as recorded by Sir John Hawkins, is directly to this point. Dr. Rush, who quotes this case, informs us he has tried the same expedient, in dropsies, both in private practice, and in the Pennsylvania Hospital, and found a confirmation of the fact.† With respect to the increase of perspiration by abstinence, it would, perhaps, be more correct to say, that it prepares the way, or rather creates a disposition in the secreting vessels, on the surface of the body, to be more powerfully acted on by diaphoretic medicines. This class of medicines are all said to exert greater effect, if given early in the morning, about day-break, than at any other time; and this must doubtless be ascribed to the increased excitability of the whole system, at that time, accumulated during sleep. That a similar accumulation of excitability ensues from withholding the customary stimulus of food, cannot be called in question; and it is equally clear that this accumulation is especially produced in the secreting vessels of the skin, owing to the well known sympathy between them and the stomach. It follows then, that any diaphoretic remedy, and even very gentle ones, exhibited in this condition of the system, assisted by moderate warmth, will act with increased energy, and this augmentation of action will be commensurate with the previous augmentation of excitability. Every one must have remarked the heat and glow of the skin, when any stimulant matter is taken, after long fasting; which exactly corresponds with the glow and heat of the skin immediately succeeding the action of vomiting.

But, however useful emetics may be thought at the approach of fevers, they are liable to many exceptions. Some persons, from peculiarities of conformation, or other causes not well understood, take them with great difficulty; in many conditions of the body they are unsafe; and in many cases of incipient fever, their operation might be followed by inconvenient or detrimental consequences.

Abstinence, the substitute here proposed, is fitted for more general application, and possesses the rare advantage of being adapted to obviate the approach, or, at least, to abate the violence of almost all acute diseases. The safety of it can scarcely be questioned in any case. If an inflammatory disease be coming on, few will doubt the propriety of total abstinence for some time, and a restriction to the mildest diet, when nourishment becomes necessary.

* Life of Dr. Johnson by Sir John Hawkins, page 499, 500.
† Med. Inquiries and Observ. vol. ii. p. 180.

To fevers, which are the offspring of miasma or contagion, this treatment is equally applicable. These poisons, whatever degrees of sameness or variety may be attached to them by different opinions, are generally supposed to affect the system by a stimulant operation, and, in arranging the means of prevention, may, at all events, be confidently associated. There seems much ground to suppose, that they ordinarily obtain introduction by the mouth, and, conveyed by the saliva, soon find a lodgement in the stomach.* By abstinence that organ is enabled to maintain a more vigorous combat, to rally all its forces; and, finally, by dint of habit, to disarm the noxious intruder. By indulging repletion at such a moment, by heaping alimentary upon morbid stimulus, the energies of the stomach must be in hazard of being overwhelmed, of sinking into indirect debility, and thereby giving deep root to a violent disease. Abstinence is also one of the most *convenient* means of preventing diseases. No confinement is necessary, no interference with the ordinary occupations of life. If the apprehensions which gave rise to it prove groundless, no trouble or injury is sustained; but the system, set free from an accustomed stimulus, feels a lucid interval, not often experienced by the votaries of luxury, and afterwards returns to the charge with redoubled gratification. If the character about to be assumed by the disease was of a moderate kind, the abstinence alone we suppose to be sufficient to strangle it in the birth; if more malignant, and our easy precaution should prove insufficient, some advantage, and not a trifling one, will at least have been gained. The stomach will, certainly, be in a better condition for the reception of other remedies.

There is scarcely any disease in which the employment of abstinence for some time, and afterwards of a mild, cooling, and spare diet, is so signally beneficial as in catarrh. If the aid of this simple treatment were not so much neglected, we should not so often see catarrh precipitated into peripneumony, or protracted into phthisis.†

To relieve the debilitated state, consequent upon intoxication with vinous or spirituous liquors, nothing is better adapted than withholding, for some time, all aliment. This remedy is the more necessary, as acute diseases are often introduced on occasions of intemperance, and a malignant and fatal character apparently imparted to them from this cause. In cases of this sort particularly, and probably in most others, where abstinence is recommended, the good effects of it will be increased by frequent draughts of cold water, and even of iced water, if cautiously used. But the

* Gardiner's Observations on the Animal Economy, p. 196.
† Medical Observations and Inquiries, vol. iv. p. 289.

cases of topical inflammation should be excepted in this observation.

Chronical vomitings of great obstinacy sometimes occur, in which it is probable a total prohibition of food and drinks, for some time, would afford relief, if any adequate mode of nourishing the body, otherwise than by the stomach, could be devised. Injections and baths of nutritive fluids, or the transfusion of blood from another animal, would be most likely to answer this purpose.

It is probable that, in some cases of fever, the stomach may be so affected by the virulence of contagion, as to become completely paralytic, and unfit for the reception of food or medicines. In such case, every thing received by that organ, if not pernicious, must be intirely useless; and, perhaps, the best means of restoring its power would consist in leaving it, for some time, in a state of perfect emptiness and quiet, and meanwhile conveying nutriment and remedies into the system by other channels.

In diseases of great direct debility, abstinence may frequently prove an excellent remedy. The reduction of excitement in the stomach, far below the natural standard, may often be necessary, in order to prepare for the invigorating operation of succeeding stimuli, which the extensive sympathies of that organ are so well calculated to propagate over the whole system.

Two cautions will obviously occur in the employment of this regimen—first, that constitutions of uncommon feebleness and delicacy, or such as are broken by intemperance, or the decline of life, can safely sustain it only in a moderate degree—and secondly, that it be not allowed, in the case of violent diseases, to usurp the place, and lead to the neglect or postponement of more active remedies. The approach of fevers may be accompanied with such signs of malignity, or the nature of the prevailing epidemic may suggest such well-founded distrust of any apparent mildness of invasion, as to render abstinence alone too weak, too dilatory, and too uncertain for a moment of such urgency. Still, however, it may be maintained, that all other remedies will derive additional force and efficacy from the co-operation of this.

Amongst all the effects of emetics and abstinence, at the approach of malignant fevers, none deserves more attention than the increased quantity of excitability which they collect. The doctrine of the effects of stimulant powers, applied to accumulated excitability, is so luminous and philosophic, rests upon so broad a basis, and is of such important and extensive application, in the conditions both of health and disease, that it can scarcely receive too much consideration. Proofs and examples of this law of animal nature are continually before our eyes. We observe it in the effects of the cold bath—our eyes experience it in passing from a

dark apartment to the light—and still more violently in the effects of too much food or warmth allowed to persons previously subjected to famine or frost. Diseases also furnish us with familiar examples of the same law, in the more powerful effects of Peruvian bark after the previous exhibition of emetics, and the redoubled efficacy of opium in relieving pain, when it has been preceded by venesection and a cathartic.

On this grand principle it is easy to perceive to what extent, and in what various degrees, abstinence may be employed as a preventive and a remedy. In the first place, it will diminish excitement, and so far lessen the amount of stimulant power, upon which the attack of febrile diseases so universally depends; and, secondly, by means of the excitability thus collected, the foundation will be laid for a more effective and vigorous excitement afterwards, when it shall be found consistent with safety. At the approach of an acute disease, the abstraction of a few meals may thus either expel it altogether, or greatly abridge its violence; and, when that is accomplished, the renovated stimulus of aliment, so congenial and salutary, will be sufficient to complete the cure. Common articles of diet are thus rendered active remedies. Powerful medicines, in too large doses, or unseasonably exhibited, are converted into poisons. Just so with respect to the mildest aliment; a certain condition of the system, viz. the fasting condition, changes it into an active stimulus; and another, viz. the starving condition, exalts the ordinary quantities of food to a deadly poison. Arsenic does not more certainly induce fatal inflammation and gangrene in the stomach, than mild food taken by a famishing person in quantity disproportionate to the collected excitability. Stimulants may not only be suited to the state of the system, but the system itself may be adapted, in this manner, to the force of stimulants. Such a remedy therefore as abstinence, possessing so great a range of power, so simple and so accommodating, if it be not allowed to supercede many others, certainly cannot be despised.

If the art of preserving health, and prolonging life, chiefly consist in a frugal and sparing use of stimuli, and adapting them with caution and skill to the fluctuating circumstances of the vital principle, we shall surely find still stronger motives to apply this doctrine at the approach and in the treatment of diseases, when noxious powers of such preternatural violence invade the body, baffle every remedy, and stimulate it to death. The regulation of this vital principle, here denominated excitability, the preservation of it when present, and the restoration of it when deficient, the restraint of excitement within the bounds of moderation, the prohibition of all wasteful and undermining excesses, will, probably, hereafter, at some more enlightened æra of medicine, form a sys-

tem of rules for the management of health and the prevention of diseases, for the enjoyments of sense, and the refinement of intellect, which, instead of the present feverish dream of human life, will present a consummation of improvement and happiness, which we now ascribe to superior beings.

I have thus undertaken to examine a noted popular observation, to inquire into its truth, and to demonstrate its consistency with the most established principles of the animal economy. If I do not mistake, it has been proved that abstinence will be often a complete, generally an useful, and almost always a safe means of obviating the approach of acute diseases. And, in a word, if it were possible to offer to mankind a maxim of universal application to the treatment of incipient fevers, in all their variations and circumstances, I should be inclined to hazard the following aphorism: *When symptoms, denoting the approach of acute diseases, are discovered, abstain, for a proper length of time, from all aliment.*

ARTICLE IX.

REMARKS ON A SINGULAR CHANGE IN THE HUMAN LIVER BY PUTREFACTION.

By Mr. FOURCROY.

[*Tranſlated for the Medical Repoſitory, from the third volume of the Annales de Chimie, p.* 120 *and ſeq. printed at Paris in* 1789]

AS yet we are but little acquainted with the intimate nature or composition of the different tissues of fibres of which the bodies of animals are composed. If we except the bones, which have been pretty well analized by Scheele, and the chemists who have followed him, the muscular flesh, the membranes, the tendons, the ligaments, the pulp of the brain and nerves, the parenchymatous structure of the viscera, which have been regarded as almost one and the same substance, more or less elaborated, organized and animalized, are not really, as yet, understood by us; every thing assures us that their component matter is not the same, that the elements which form them are in very different proportions, and that their structure, composed of principles differently combined, is destined for different functions. In attending to what an exact analysis has afforded on this subject, we must be careful to collect all the facts which appertain to it. I have already got together several of these facts from different works. That which I am now going to offer is of a kind capable of throwing light upon the bile and the diseases of the liver.

The late Mr. Poulletier de la Salle, who had devoted his life to the study of the useful sciences, and who cultivated, with particular success, anatomy and medical chemistry, had exposed to the air a bit of human liver, suspended by a piece of pack-thread. This bit, without being destroyed by putrefaction, had, from the beginning, emitted a disagreeable odour; the larvæ of insects, and particularly of the dermestes lardarius, bruchus, &c. had preyed upon it, until at last it became dry by degrees, and turned to a grey and friable substance. It had been thus exposed for more than ten years, and, for the last three or four, it appeared to undergo no new changes. Mr. Poulletier was desirous of knowing its composition, and brought it to my laboratory in May, 1785. At first sight this bit of liver would have been taken for an earthy substance, similar to mineral agaric; but, on a nearer examination, pieces of dried membranes were yet observable, of a brown

colour, as well as vascular strings in an equal state of dryness: rubbed by the finger, it felt fat and soft, like a sort of soap.

The examination we made of this liver gave us results very different from those which its appearance seemed to announce.

1st. We put a small piece of it upon a burning coal; it immediately grew soft, emitting the smell of burning grease; it presently melted altogether, puffed up, turned black, and left a light coaly matter, which, on being strongly heated, was converted into white ashes. This first experiment satisfied us that this animal substance was not reduced to a mere lump of earth, as its first appearance might have led us to believe, and determined us to analize it with greater care.

2dly. Although we could not expect to obtain a very exact result from the distillation of this substance, on account of the small quantity which we had to submit to this trial, we still thought proper to try half an ounce in this way. There passed first some drops of a white water, of a faint smell; a white smoke, more thick, and manifestly oily, very soon succeeded this first product. This vapour condensed into a white concrete matter, sticking to the neck of the retort; it then diffused a very tainted odour; the concrete oil took on a russet colour, and a little carbonated hydrogene gas came over. It appeared that a great part of the liver had passed without decomposition. It was remarkable that the concrete oil, collected in the neck of the retort and in the receiver, had a lamellated and crystallized appearance. The products manifested neither an acid nor an alkaline character.

3dly. One *gros** of the dried liver was put into two ounces of distilled water; a small part only seemed to dissolve in the water by mere heat. This solution was whitish, and opaque; it had somewhat the smell of soap, and afforded a great number of bubbles, by agitation. Its smell was faint, and it turned the syrup of violets sensibly green. Lime-water, without sensibly precipitating it, rendered its odour a little fœtid. The portion of liver not dissolved by the water, was melted by heat, and crystallized on cooling. It gave out a greasy smell, and was inflammable.

4thly. We treated a gros of the dried liver, without heat, with an ounce of the ley of caustic pot-ash; and, by simply rubbing in a mortar, the alkali appeared to act very sensibly upon the substance; there was disengaged a slight ammoniacal smell; and the ley lathered. On heating this mixture, the liquor took on a brown colour, and emitted the smell of heated soap. After boiling about a quarter of an hour, it was filtered hot, it was of a deep russet colour, and passed very well through the paper employed (Papier Joseph.) On cooling, this solution turned to a brown concrete:

* *A gros* is nearly equal to our drachm.

distilled water, of a boiling heat, dissolved it wholly, without leaving any part. The whole substance of the liver had been dissolved by the fixed alkali, even the membranous and fibrous portions we have described. The solution in water lathered strongly on being shook; on cooling, it grew turbid, and let fall some slight curdles of a white colour. Lime-water decomposed it, and precipitated it in abundance of curdles: acids, in like manner, decomposed it, as well as the earthy neutral salts. There was no doubt that the alkali had dissolved a fat oily matter, and formed a homogeneous soap. The indissolubility of the liver in water, or at least its trifling solubility, satisfied us that it consisted, in a great measure, of an oily substance, prone to concrete, very soluble, by means of alkalis, and easily forming soaps with that order of saline substances. We next wanted to know the nature of this oily matter, and to determine whether it was combined with any other animal substance. The following experiment tended much to elucidate this point.

5thly. One gros of dried human liver, reduced by the pestle to a sort of gross powder, was treated with two ounces of alkohol, of thirty-six degrees of the areometer of Mr. Beaumé. The action of this fluid was aided by a moderate heat; after remaining together for two days, the alkohol acquired a russet colour; and a smell, slightly fœtid, was added to that which it had been accustomed to emit. This liquor was filtered, to separate the dissolved portion from the part on which the alkohol had no action. One drop of this sort of tincture, let fall into water, afforded a very thick white cloud, and a very perceptible precipitation. Evaporated from a china saucer, in the heat of a sand-bath, it left a yellowish plate, which appeared, at first sight, to be a resinous matter; water, however, applied to this matter, dissolved a small part of it, gave it a white colour and a clotted appearance, which made it resemble grey concreted oil.

The portion of liver not dissolved by the alkohol, weighed, after being dried, half a gros; the alkohol had, therefore, carried off almost the half of its weight. Four ounces more of this menstruum, applied, at two separate turns, to this piece of liver, dissolved still a part of it: there remained yet near twenty grains undissolved; and we remarked, that this residue consisted of the membranes and vessels which had escaped the action of the alkohol. The parts dissolved by this liquor, in the two last experiments, were, in all respects, like the first: water also carried off a small portion of colouring and soapy matter. The substance separated by water from the solution in alkohol, and precipitated in white curdles, has been separately examined; as it was this upon which it seemed more particularly necessary to fix our attention. The properties it presented have led us to a conclusion intirely different from

what has been hitherto known concerning animal analysis. We had prepared thirty-seven grains of this substance pure, and separated from the part which is soluble in water. It was then of a yellowish colour, soft and greasy to the touch, like a concrete oil. We put it into a matrass, which was immersed in hot water. It grew softer, and intirely melted before the water was boiling hot: when quite liquid, it had a yellowish brown colour, and a faint smell, like melted wax. The fœtor which this substance possessed, before the action of the alkohol, did not exist after its solution in that liquid. After it was completely melted it was run into a china cup, where it formed a solid cake, brittle, and very smooth on the side next the cup. It broke clean, and with a little snap; and exhibited, in its inside, a lamellated structure, and was manifestly crystallized. Hot alkohol dissolved it completely; and it presented all the properties of the concrete animal oil, known, in commerce, by the name of spermaceti, with this difference, that it was not so dry, so white, and so transparent, as the genuine spermaceti, and was easier of solution in alkohol than that animal oil.

6thly. We put two gros of the dried liver, cut into small bits, into a matrass, which was held in water heated to the sixty-eighth degree (185th of Fahrenheit) of Reaumur's thermometer. A part of the liver grew soft, and melted. The portion of liquefied oil, separated by squeezing, and hardened by cooling, presented nearly the same characters as that which had been dissolved in alkohol. The only two circumstances of difference which we remarked were: 1. That the oil pressed immediately from the liver, was higher coloured, and more fœtid, than that which the alkohol had taken up. 2. That it contained a portion of soap, which, in the former experiments, had been separated from the alkohol by the water.

7thly. This portion of saponaceous matter, which we had looked upon merely as an extract in our first experiments, now attracted our attention; it was certain that it was carried off from the dried liver by the water, as well as by the alkohol; but we had as yet no precise idea of its nature. The small quantity of dried liver which we had to make our trials with, was not sufficient for the numerous trials requisite, to come at an exact knowledge of the elements constituting this soap, nor of their proportions. All that we could determine upon this point was, that the soap appeared to be formed from a concrete oil, similar to that procured by pressure, with the conjunction of ammoniac and soda. We even conjectured, that before this liver was completely dried, and before its total conversion into a concrete oily substance, the oil was, from the beginning, in a saponaceous state, intimately combined with soda and ammoniac. What led us to

this conjecture was, that the portion of ammoniacal soap, which remained still in this piece of liver, and whose presence was evident, both from the ammoniacal odour extricated by quicklime, and from its solubility in water, appeared to us to be more abundant in the internal part of the liver we examined, where, by reason of its remoteness from the surface, it had been less exposed to the air.

The facts which have been set forth, as has been already mentioned, were disclosed in the beginning of the year 1785; they were entered in my journal of experiments, and I was waiting for other analogous facts, to connect them with the collected materials of animal analysis. In short, they were looked upon simply as a discovery, having little or no connection with any thing else, until the year 1786, when a great opportunity presented itself of examining animal substances buried in the earth, all lengths of time, from more than forty-two years, down to but a few months, in the cavity of the burying ground of THE INNOCENTS.—During the decay of these bodies, there was formed an oily substance, quite similar to that constituting the basis of the dried liver, whose history has been related.

The nature and properties of these animal substances, changed to an oil resembling spermaceti, united with a large quantity of ammoniae, will make the subject of a memoir, which shall be published in one of the next succeeding numbers of the Chemical Annals. It is sufficient for me to remark, in this place, that the conversion of the substance of the liver, into a concrete oil, analogous to spermaceti, is not the only fact of the kind that has fallen under my observation. A ray of light has suddenly illuminated this part of the analysis of animal substances, and there appears to be demonstrative evidence that, in the progress of a slow decomposition of the dead bodies of animals, many of the soft parts undergo a change similar to that of the liver, which forms the subject of this memoir. I further discovered, that the bodies of quadrupeds, and even those of men, without passing through any real putrid alteration, contained this concrete oily substance, as the brain and vertebral cavity of cetaceous animals: in short, that in certain cases, this oily matter is more abundant, and is amassed in several cavities, where it often forms concretions extremely injurious to the animal economy. I shall explain, in another place, how this fat, concrete substance, which is extracted, in such abundance, from the bodies of animals of the whale kind, differs from grease or adipose matter; I shall endeavour to make it appear, or to determine, how the basis of the soft organs of animals is changed into this sort of oily concrete, and how ammoniac is formed at the same time in the bodies of animals.

I shall here conclude the history of the first class of facts which have presented themselves to me on the discovery of this singular substance, and that the order of the discoveries, to which this, as I may say, has conducted me, might not be interrupted. I had thoughts of adding to this memoir, my own observations on the flaky substance, found by the late Mr. Poulletier, in his human gall-stones, and upon that of some concretions in the gall-bladder, which have not, as yet, been described by physicians.

ARTICLE X.

CASE *of* FEVER, *supposed to have been caused by Exposure to the Exhalations of putrid Beef. Communicated by* SAMUEL OSBORN, *Surgeon to the Federal Garrison on Governor's Island.*

JOHN DEMING, a soldier belonging to this garrison, in the latter part of June last, was excused from duty, on account of a gonorrhœa, which, from long neglect, had become violent and obstinate. A lodging was assigned him in a house without the garrison; the part of which occupied by him, previous to his entering it, had been seldom or not at all visited for some time.

On the first of July he was seized with nausea, rigors, pains in his head, back, and bowels, accompanied by difficult respiration; a thick yellowish fur on his tongue, and quick and weak pulse. His venereal discharge ceased on the first commencement of these symptoms. I gave him, on the first visit, a cathartic of jalap and calomel; after waiting six hours, and no evacuation being effected, an injection was administered, which procured a discharge of a blackish colour and extremely fœtid smell.

July 2d. This morning I found him free from the pain in his bowels, his respiration less difficult, his pulse more full, and not as frequent as yesterday; his eyes remarkably inflamed, and the expression of his countenance wild. He was afflicted with extreme thirst, and all endeavours to assuage it by oranges, lemonade, &c. were ineffectual. At night the pain in his bowels returned, accompanied by extreme heat all over his body. He had stools (by means of injections) similar to those of yesterday. Towards midnight he became more easy.

July 3d. This morning I found him somewhat delirious—his eyes wild and much inflamed, with a slight yellow tinge over his whole body. He was now afflicted with pains in his bowels more violent than before, which were relieved after two copious evacuations. His nausea, which had been incessant to this time, now left him, but was succeeded by a distressing hiccup. At night all his symptoms were abated, and he appeared likely to have some rest.

July 4th. The latter part of the last night, after some quiet sleep, his pains returned with increased violence, with sighing, restlessness, repeated and copious vomitings of a bilious matter, alternating with a hiccup, which was extremely distressing; his wildness and delirium still continued, and the yellowness of his skin was much increased.

July 5th. This morning I found him better, and greatly refreshed by a quiet sleep: at noon he had scarcely any fever.

July 6th. His sleep the last night was interrupted by intervals of restlessness, and nausea. In the morning he was free from fever, but complained of general uneasiness and want of rest, which he obtained in the course of the day, and at night appeared more easy, and likely to rest well.

July 7th. He slept well the last night, and in the morning I found him much better, and intirely free from fever. After this he had no other complaint than general lassitude and debility, the natural consequence of the disease.

From the commencement of my visits to this patient, I was affected, while in the house where he lay, by an extremely offensive smell, for which I was unable to assign any other causes than the attendants' neglecting to remove the fœtid stools of the patient, and other inattentions to cleanliness. The stench continuing after careful dilligence had been used to obviate the supposed causes, I ordered the cellar under the patient's room to be examined, where were found three barrels of beef, in a state of extreme putrefaction. So exceedingly offensive was the smell emitted from this mass of animal putrefaction, that the soldiers who were employed to remove it, were several times forced to desist, for the purpose of breathing fresh air, before they could accomplish their design. On the discovery and removal of this putrid beef, which was made on the fourth of July, and which immediately struck me as the cause of my patient's fever, he gradually mended, and on the thirteenth of July, his venereal discharge, which had ceased at the first attack of fever, without recurring again during the time of his confinement, re-appeared.

It is worthy of remark, that a soldier, attending the patient whose case is above related, was, on the fourth of July (the day when the putrid beef was removed from the cellar) attacked by the usual symptoms of yellow fever, but a powerful cathartic removed all complaint in twenty-four hours, except a weakness, which I attributed to the powerful operation of the medicine.

It may be proper to observe, that the vomitings noticed as having occurred on the fourth of July, were excited by no nauseating medicine, but appeared to form part of the progress of the disease; the patient having been afflicted with nausea, which had increased, with very little intermission, from the first. They (the vomitings) were finally obviated by the occasional administration of Riverius' mixture, but not until after the removal of the putrid beef; the patient's recovery, from that time, was very rapid.

In stating the preceding case, the particular treatment has been purposely omitted, that the facts might appear more connected and precise.

Governor's Island, October 15th, 1797.

REVIEW.

ART. I. *Medical Inquiries and Observations:* Containing an Account of the bilious remitting and intermitting Yellow-Fever, as it appeared in *Philadelphia*, in the year 1794. By *Benjamin Rush*, M. D. &c. &c.

[*Continued from page* 79.]

IN the second part of the work before us Dr. Rush proceeds to deliver his doctrine concerning the proximate cause of fever.

In order to render more intelligible, and to establish his theory of fever, Dr. Rush premises the following general propositions.

1. Fevers of all kinds are preceded by general debility, direct or indirect, as may be inferred from their causes. The causes of fever, which act by inducing direct debility, are cold—the passions of fear, grief and despair—all excessive evacuations, whether by the bowels, blood-vessels, pores, or urinary passages—famine, or the abstraction of the usual quantity of nourishing food.

The causes which predispose to fever, by inducing indirect debility, are heat—intemperance in eating and drinking—fatigue—and certain powers which act by overstretching, wounding, bruising, compressing, burning, &c.

2. Debility, whether direct or indirect, is always succeeded by increased excitability, or a greater aptitude to be acted upon by stimuli.

3. The diminution or abstraction of one stimulus is always followed by the increased action of others.

4. The stimuli, which are the remote or exciting causes of fever, operate on the system in a manner wholly different from the ordinary stimuli of health. In health there is a constant and just proportion between the degrees of excitability, excitement and stimuli. In predisposition to fever, this ratio is destroyed; and hence the preternatural force of stimuli produces irregular action, or a convulsion in the arterial system.

5. The stimuli, which induce the irregular action or convulsion of fever, act, for the most part, primarily upon the sanguiferous, and particularly upon the arterial system.

6. There is but one remote cause of fever, and that is stimulus. Heat, alternating with cold, marsh and human miasmata, contagions and poisons of all kinds, intemperance, passions of the mind, bruises, burns, and the like, all act by a stimulating power only in producing fever.

7. There is but one fever. However different the predisposing, remote, or exciting causes of fever, the unity of it still remains the same.

8. All ordinary fever being seated in the blood-vessels, it follows, of course, that all those local affections we call pleurisy, angina, phrenitis, internal dropsy of the brain, pulmonary consumption, and inflammation of the liver, stomach, bowels and limbs, are symptoms only of an original and primary disease in the sanguiferous system.

Having premised these general propositions, Dr. Rush goes on to remark, that a fever (when not misplaced) consists in a morbid excitement and irregular action in the blood vessels, more especially in the arteries.

This irregular action he asserts to be, in other words, a convulsion in the sanguiferous, but more obviously in the arterial system.

That this is the case, he infers from the strict analogy supposed to exist between symptoms of fever, and convulsions in the nervous system. And in support of this opinion, the analogy is pursued into a number of particulars, minutely compared, exhibiting a coincidence and similarity of phenomena which cannot fail to impress the reader.

From the series of facts and analogies now mentioned, Dr. Rush concludes, that *irregular action, or a convulsion of the blood-vessels*, is the proximate cause of fever. And his whole theory of fever resolves itself into a chain, consisting of four links. 1. Predisposing debility, or weakened excitement of the blood-vessels. 2. An increase of their excitability. 3. Stimulating powers applied to them; and, 4. Irregular action or convulsion.

Having thus delivered his fundamental doctrine, the author proceeds to examine how far it accords with the phenomena of fever, which he divides into two kinds.

1. Such as are transient, and more or less common to all fevers. These he calls *symptoms* of fever, and proceeds to explain the production of them in the following order—lassitude—cold fit—tremors—pains in the head, breast and bones—vomiting and diarrhœa—want of appetite, and costiveness—dry skin, or partial sweats—high coloured and pale urine—suppression of urine—thirst—white, yellow, dry, dark, and black tongue—varieties in degree and distribution of heat—and eruptions.

2. The author proceeds to apply his theory to the description and explanation of what he denominates the different *states* of fever.

Having maintained that there is but one fever, he, of course, rejects its artificial division into genera and species. A disease which so frequently changes its form and place should never have been designated, like plants and animals, by unchangeable characters. Much mischief has been done by nosological arrangements

of diseases. They erect imaginary boundaries between things which are of a homogeneous nature. They degrade the human understanding, by substituting simple perceptions to its more dignified operations of judgment and reasoning.—But, in thus rejecting the nosologies of the schools, the author does not wish to see them banished from the libraries of physicians; when consulted as histories of the effects of diseases only, they may still be useful.

Excess in the force and frequency of the action of the blood-vessels, has been considered as the characteristic mark of what is called inflammatory fever. But there are marks which indicate a much greater excess of stimulus upon the blood-vessels. These are preternatural slowness, intermissions and depression in the pulse, such as occur in certain malignant fevers. In applying his theory of fever to the explanation of all its different states, the author is led, by this view of its inflammatory state, to consider them in the order of their inflammatory character, or according to the force of stimulus which acts upon the blood-vessels. The following appears to be the usual order of inflammatory diathesis, presented to us by nature, in the different fevers described by medical writers.

1. The plague. 2. The yellow fever. 3. The natural small-pox. 4. The malignant sore throat. 5. The fever from the alternate action of cold and heat on the body, appearing with the symptoms of pleurisy, rheumatism, tonic gout, internal dropsy of the brain, and pulmonary consumption. 6. The measles. 7. Catarrh from cold, and influenza from contagion. 8. The common remitting fever, appearing occasionally with the symptoms of colic, dysentery, inflammation of the liver, and internal dropsy of the brain. 9. The scarlatina, puerperal and hectic fevers. 10. The jail fever. 11. The common mild intermittent.

This scale of the degrees of morbid action in fevers is taken from their usual symptoms. But these vary with climate, season, and habit.

In pursuance of the author's plan of substituting in the place of the usual names of fevers, certain definite states which may be applied, with varying circumstances, to them all, he divides them,

1. Into such as affect the whole arterial system, with no, or but little local affection. Under this head are comprehended the *malignant* state of fever, which constitutes the highest grade of inflammatory diathesis. The *gangrenous* state of fever, commonly denominated putrid—the *synocha*, or the common inflammatory state of fever—the *bilious* state of fever—the *typhus* state of fever—the *typhoid* state of fever, inclining more to typhus than to synocha—the *synochoid* state of fever, approaching nearer to synocha—the *synochula* state of fever—the *hectic* state of fever—the *intermit-*

ting and *remitting* states of fever—the *sweating*, *fainting*, *burning*, *cold* and *chilly* states of fever.

2. The author proceeds next to enumerate those states of fever in which there are local affections, combined more or less with general fever. The following belong to this second head. The *intestinal* state of fever, including cholera, diarrhœa, dysentery, and colic—the *pulmonary* state of fever, including pneumony, true and bastard, also catarrh from cold and contagion, and chronic pneumony, or pulmonary consumption—the *anginose* state of fever—the *rheumatic* state of fever— the *arthritic* or *gouty* state of fever—the *maniacal* state of fever—the *apoplectic*, *phrenitic*, *paralytic*, *lethargic*, *vertiginous*, *hydrocephalic*, *nephritic*, *hydropic*, *eruptive*, *hæmorrhagic*, *amenorrhagic*, *hæmorrhoidal*, and *opthalmic* states of fever.

3. In the third and last place, the author mentions the *misplaced* states of fever. The periodical pains in the head, eyes, ears, jaws, hips, and back, which occur in the sickly autumnal months, and which impart no fulness, force or frequency to the pulse, are all *misplaced* fevers. Under this last head are included, the *hepatic* state of fever—the *convulsive* or spasmodic state of fever—the *hysterical* and *hypochondriacal* states of fever—and the *cutaneous* state of fever.

In order to appreciate the importance and difficulty of an inquiry into the proximate cause of fever, it will be sufficient to recollect the learning, acuteness and diligence, which have been often exerted, and the little success which long attended this point of medical research.

Without going back to distant times, it may be observed, that the fruitless labours of Boerhaave, Hoffman and Cullen are in every body's recollection. The disquisitions, however, of these physicians, though they may be pronounced unsuccessful as to the main object of inquiry, have not been intirely without advantage. If their discoveries have not illuminated the paths to be trodden by their successors, at least their mistakes and errors have so palpably blocked up the way, as to make it necessary to shun the course they attempted to pursue, and to explore a new route in quest of truth.

Among such as have more successfully investigated this subject, we are happy to find the author of the present work. His doctrine, in general, is simple, clear, and well combined; he has lopped off many of the mistaken facts of former writers, and cleansed, of much fanciful rubbish, the augean stable of theory; and he has availed himself, in a judicious manner, of some important laws of the animal economy, which have been lately brought to light.

We are not sure that, in every point, we clearly comprehend the meaning of the author. His proposition, that " indirect de-

"bility, particularly if suddenly induced, is always succeeded by "increased excitability, or a greater aptitude to be acted upon "by stimuli," appears to be too general and unqualified. Some of our readers may, perhaps not without reason, doubt the consistency of this with the other leading positions. If it be admitted, that stimuli, in producing excitement, constantly expend the principle of life, or the excitability (and we see not how this can be questioned) it appears difficult to perceive in what manner indirect debility, the effect of excessive stimuli, however suddenly induced, can be attended with an accumulation of this same vital principle.

The essence of indirect debility seems to consist in a deficiency of excitability. The suddenness with which this deficiency may be produced, by the quick and violent operation of stimuli, can scarcely, we apprehend, so far vary the effect, as to give countenance to the supposition, that the excitability is accumulated.

It will be readily admitted, that stimuli may often have a twofold effect, or, in other words, that expenditure and accumulation of excitability may frequently be the simultaneous effect of the same cause; as when certain quantities of alkohol, wine or opium are taken, which, at the same time, exhaust excitability by increasing action, and produce additional supplies of it, by their operation on the sensorium.

From the ever-varying quantities of stimulus and excitability, considering them either in a distinct or relative view, a correspondent vicissitude in the degree of excitement must constantly be taking place. The phrases, *direct and indirect debility*, seem scarcely to express the conditions of the animal system, which they are intended to represent, with sufficient accuracy and precision. They are so much calculated to perplex and mislead, that we suspect much of the obscurity of the passage under consideration may be ascribed to the author's adopting this form of expression. And while these phrases, from their circuitousness and ambiguity, stand in need of constant qualifications to guard them from being misunderstood, we cannot but think it expedient to dismiss them from medical language, and to substitute modes of expression more conformable to the simplicity and truth of the natural fact.

[*To be continued.*]

ART. II. *Medicaments, et Precis de la Methode de Mr. Masdevall; &c. &c.—That is, Prescriptions, and a Sketch of the Method of Mr. Masdevall, Physician of Charles the Fourth, King of Spain, for curing all epidemic, putrid and malignant Distempers, Fevers of different Kinds, &c. &c. with the Means of Prevention. Divided into Paragraphs, for the Use of Families who are unable to procure Physicians.* New-Orleans. *Duclot.* 1796. pp. 48. 8vo.

THIS pamphlet, which is dedicated to the Baron de Carondelet, the Governor of New-Orleans, whose name appears in the correspondence with the commissioner of the United States, now employed in running the disputed territorial line between Georgia and the Floridas, is intended as a sort of popular work, or book of direction, for the use of his Catholic Majesty's subjects in Louisiana. The history of the directions it contains is this: in the year 1783, while Catalonia, in Spain, was laid waste by an epidemic disease, Dr. Masdevall was appointed by Charles IV. to inquire into the cause of the disorder, and its method of treatment, and report thereupon. It appears that this *inspector of the epidemics* (this was his title) was not only very successful in his mission, but published, in 1786, a circumstantial account of what he had done. In this he exhibits the mode of practice which, after twenty years experience, he found to answer best, and which he thinks preferable to any that has been adopted from the time of Hippocrates to the present day.

Mr. Masdevall assures his readers, that so far from having obstructions of the bowels brought on by following his method, they may, with confidence, expect their uneasy symptoms to cease on or before the fourteenth day, if the remedies are employed early. He declares his method a true specific against all fevers of the putrid, malignant, epidemic, quotidian, intermittent, bilious, purple, miliary, ardent, remittent, and pestilential kinds, particularly those proceeding from a putrid air, from the infectious vapours of burying-grounds, jails and hospitals; from ships, and low and marshy places.

An abstract from such a work as this, was thought a proper publication in the king of Spain's American dominions; and, by the approbation of government, grounded upon the testimonials of Dr. M.'s success, submitted to the captain-general of Catalonia, and to the Count of Florida Blanca, the pamphlet now before us has been extracted from the larger work, to instruct the people of Louisiana, in times of sickness, how to employ the means found to be so remarkably beneficial, in one of the principal provinces of Spain.

The publication now before us, being merely a manual of prac-

tice, contains not any description of the country, climate, or disease, but simply states Dr. M.'s method of treating putrid, bilious, or pestilential fevers. His practice is simple, and his remedies few, in these formidable diseases. These we shall particularly lay before our readers. The whole of the internal means Dr. M. prescribes may be comprized under three heads: 1. His ANTIMONIAL MIXTURE; 2. His FEBRIFUGE OPIATE, or, more properly speaking, ELECTUARY; and, 3. His ANTIFEBRILE CLYSTERS. The use, application, and directions, relative to these, make the sum of Dr. M.'s discoveries.

The antimonial mixture is ordered to be made according to the following receipt: take of viper-water five ounces, emetic-wine one ounce, powdered cream of tartar one dram; mix for use. If the viper-water cannot be got, the water of carduus benedictus, borrage-water, or poppy-water, may be substituted for it. As the valuable and operative part of the remedy is the antimonial wine, it may be employed, indeed, by itself; but as the cream of tartar can be procured every where, there will be no difficulty in adding that ingredient to the mixture. The formula now given, is adapted to the ordinary constitutions of the young and robust. The dose is, on the first day, a tea-spoonful, poured out after shaking up the phial, mixed in half a cupful of common water, of the existing temperature; and a cup of the same water is directed to be drunk immediately afterwards. An hour and a half after the first dose, a bowl of light broth, perfectly free from fat, is to be drank, or, if this cannot be had, some thin panado, or gruel made of Indian meal. An hour and a half after this, another dose is to be taken, after the manner of the first, and in that way, alternately, a dose of the mixture and a draught of the soup, for four or five days. And if the patient cannot sleep, the treatment must be continued during the night, as long as he continues awake.

The usual operation of the first or second spoonful of the mixture, is to promote gentle vomitings or stools, or sometimes a slight looseness, with comfortable unloading of the alimentary canal. The succeeding doses will not purge much more, but will promote perspiration very freely, and increase the quantity of urine.

It is hardly necessary to observe that Dr. M. is very particular in proportioning the quantity of the antimonial to the age and strength of his patient. By the help of this mixture, he says, if it be administered *from the beginning of the disease*, the fever commonly abates, so as gradually to go off intirely between the fifth and the eleventh day.

The febrifuge electuary is composed of a dram of the salt of wormwood (carbonate of pot-ash,) a dram of sal ammoniac (muriate of ammoniac,) eighteen grains of tartar emetic (antimoniated tartrite of pot-ash,) and an ounce of finely powdered Peruvian

bark, made into an electuary, with a sufficient quantity of the syrup of wormwood, and is to be employed, after the FIFTH day of the disease, without delay, if the symptoms have not already abated by the use of the preceding mixture. A sixth part is to be taken at a dose, mixed with pure water, and in conjunction with the usual proportion of the antimonial mixture; the patient drinking cool water afterwards and between whiles. If the weather is very hot, the drink should be cold, even as cold as ice. He must then go on taking between the doses of the medicine just mentioned, some of his soup; and thus continue for several days, until the disease relents. If the symptoms do not yield, the doses are to be increased in quantity and frequency.

The anti-febrile clyster is made of the febrifuge electuary ordered in the preceding formula, the whole; of the blessed laxative (we are not certain what this laxativum benedictum is) and of emetic wine each two ounces; mix for ingredients of two injections. Warm water, honey, and oil added to these, are to be administered, and the whole retained in the body as long as possible: and these are to be repeated, according to the exigency of the case, in greater quantity and greater frequency.

Dr. Masdevall rests the cure pretty much upon these remedies, and rejects the cordials, blisters, caustics, and antidotes of the vulgar medical practice. He also is opposed to frequent blood-letting, advising it to be performed upon patients of a sanguineous and vigorous constitution only, and on such no more than once or twice, and that in the beginning of the disorder. What is very curious is, that he considers health and life so intirely residing in the blood, that he affirms, upon the authority of Leviticus xvii. 14. there must be much danger in drawing off that fluid, upon which the existence of life so materially depends.

In the course of the sickness he allows his patients as much cool water or lemonade as they choose to drink; together with cherries, water-melons, strawberries, and any other ripe fruits of the season; and he permits pure chocolate, almond milk, gruel, rice, thin soups, greens, and a little good wine with the fruits. And after the febrile commotion has, by these means, subsided, the alimentary canal should be cleansed by moderate cathartics of neutral salts.

Such is the summary of the Spanish method of cure contained in the publication of this celebrated physician: and we have thought it worth the while to be the more particular in detailing the practice, because, although the inhabitants of the Spanish dominions, both in Europe and America, are subjected to febrile distempers in a great variety of alarming forms, yet the publications of their physicians have rarely reached us, and we are therefore almost wholly uninformed of their method of treatment: we had

rather thought the practitioners of that nation had not published much on the subject, since, in the malignant fever of Barcelona, a few years ago, the Court of Madrid, as is related, wrote the prescription; and, by the command of his Most Catholic Majesty, the physicians were ordered to adhere to it, and forbidden to prescribe any thing else! Amidst the conflict of opinion on the preferable mode of managing these complaints, the reader has it now in his power to judge of the probable efficacy of Dr. Masdevall's method, and compare it with that recommended by other practisers. From some paragraphs in the work before us, we find the physicians of Havannah blamed for not having adopted it, and great benefit derived from the employment of the means recommended in the dreadful sickness of Carthagena, described by Dr. Rodon-Bell in 1787.

As to the prevention of fevers in epidemic constitutions of the air, the author has said very little of any thing remarkable; though besides the common observations about cleanliness, ventilation, &c. avoiding fogs, dews, and night air, he recommends to the well and uninfected, *a vegetable* diet of legumes and ripe fruits, with *very little animal* food. He positively forbids *pork*, but allows a small quantity of good wine. The advocates of temperance and abstinent regimen in pestilential seasons, have here another authority in favour of that system of mild and moderate living which it becomes all prudent persons to adopt in times of such calamity and danger.

ART. III. *Considerations on the Doctrine of Phlogiston and the Decomposition of Water.* By *Joseph Priestley*, L. L. D. F. R. S. &c. &c. Philadelphia. *Dobson.* 1796. 8vo. pp. 39.

THE worthy and indefatigable author of the pamphlet before us, since his arrival in America, continues his chemical labours, and appears as zealous as ever to promote the progress of science. It must give pleasure to every philosophical mind to find the United States becoming the theatre of such interesting discussion as now occupies some of the leading chemists of the day; for this essay, which is addressed to Messrs. Berthollet, De la Place, Monge, Morveau, Fourcroy, and Hassenfratz, the surviving answers of Mr. Kirwan, has been answered, as we shall more particularly observe in its proper place, by the *ci-devant* Minister of the French Republic to the United States, ADET, just before his departure from Philadelphia to France, in May last. We hope that publications upon such subjects, by men of so much ability, will not only prove on which side of the argument the truth lies,

but will be a means of diffusing a taste for this kind of philosophical research among the people of the western world. And we feel a degree of satisfaction in ascribing a considerable part of the increasing taste and prevailing fashion for chemical pursuits, in this country, within a year or two, to the influence and example of Priestley.

Considering that what he had observed in several of his publications had not been duly attended to, or well understood, the author, although he allows he has nothing materially new to advance on the subject, wishes to make one appeal more to the philosophical world: he therefore attempts to exhibit, in one view, the more considerable objections to the antiphlogistic system, with the intention of bringing forward the favourers of the new doctrine to the explanation of these difficulties, by the aid of additional *facts*, and more cogent *arguments* than have hitherto appeared.

Although the Lavoisierian theory had made proselytes of the greater part of the philosophers in Europe and America, and though Dr. Priestley had observed his friends and acquaintance deserting the standard of phlogiston, not merely one by one, but frequently going over to the other side in whole troops, he has never yet found himself disposed to change sides and engage in this revolutionary scheme. Firm in his original persuasion, that the doctrine of STAHL is preferable upon the whole, he adheres to it upon principle; professing, at the same time, with perfect candour, his willingness and readiness to adopt the sentiments of his opponents whenever they shall convince him he is wrong.

The controversy seems to rest here, that the weight of evidence which has been sufficient to induce Kirwan, Black, Gren, and many others of the phlogistic chemists to adopt the theory of Lavoisier, has never yet appeared to Dr. Priestley considerable enough to influence his judgment, or gain his assent. The considerations which have induced almost every other chemist to favour the new system, have failed to work a similar effect upon the mind of our author; and after the conversion of the greater part of the persons who used to think as he does, he calls upon the advocates of the modern opinions to produce, if they can, evidence cogent enough to convince *him*. Though this adherence to a man's particular notions has been termed prejudice by some, we are inclined to give it a more gentle appellation, as we are satisfied there is a becoming and manly spirit in refusing to bow the knee at the shrine of *authority*, and a disposition particularly favourable to the investigation of the *intire* truth, when they upon whom the burden of the proof lies are compelled to establish every point as they proceed, and to take nothing for granted.

The first class of Dr. Priestley's objections arises from the doubts which he entertains concerning the constitution of metals. The

phlogistic system teaches that metals are compounded of a certain earth, or calx, and phlogiston; and that when phlogiston flies away, the splendour, malleability, and ductility of the metal vanishes with it, and leaves an inert calx behind. According to the antiphlogistic doctrine pure metals are not *compounded*, but, on the contrary, are *simple* substances, and owe their calciform state not to the departure of phlogiston, but to the absorption of oxygene, or the basis of vital air. Our author denies that the latter opinion is universally true. He takes quick-silver as an example. Though the mercurius precipitatus per se may be such a composition, yet it is, he contends, unfair to reason from this to all other calces of mercury, and thence to the calces of all other metals, that their calciform state is always derived from their incorporation with oxygene. In particular, the calx which remains after exposing turbith mineral to a red heat, cannot, he says, be revived by any heat, but may be completely reduced by inflammable air, charcoal, iron-filings, or any substances which contain phlogiston. This phlogiston, he contends, is necessary to constitute the calx a metal, in the present case, and consequently in all cases of mercurial reductions; and if a judgment be formed from the calces of metals, and from other circumstances, he says, there are few, if any of them, that do not contain more or less of phlogiston. He observes, that both precipitate per se and minium, if made with proper attention, may be revived without yielding any air; though this, he believes, is owing to their want of water, which he thinks essential to the constitution of every kind of air.

From the exposure of iron to the heat of a burning lens in confined air, the air is diminished, the metal becomes a calx, and something possessing a strong smell is emitted from it. Dr. Priestley thinks this is evidence that iron not only attracts something, but also emits something; and that this, which, with the aid of water, forms inflammable air, is the phlogiston lost by the iron. He denies that the change wrought in the confined air is to be fairly ascribed to the separation and fixation of its oxygenous portion, but that the phlogisticated air is produced by the union of the phlogiston of the iron with the dephlogisticated air: and what is true of iron in this case is true of the same metal in every other case, and of all other metals, as well as of sulphur and phosphorus.

The author is further of opinion, that during the dissolution of metals in acids, the inflammable air produced does not proceed from the water decompounded, but from the phlogiston emitted by the metal. And in the case of the supposed decomposition of water by hot iron, the inflammable air comes from the decomposition of the iron, and not from hydrogene, the imagined basis of water.

Dr. P. next proceeds to examine the celebrated experiments on the composition and decomposition of water. After all that has been done, and all that has been said on this interesting subject, by the able and experienced chemists, who have stated the results of their trials to the public, he still maintains the whole of their experiments are very liable to exception, and that the doctrine of phlogiston easily accounts for all they have observed. He admits, that in the common experiments of making water pass through a red-hot iron tube, *inflammable air*, and *finery cinder* are formed; but he denies that this finery cinder is a mere calx of iron, formed from the union of the iron with the oxygene of the water, but a combination of iron with water itself; and favours the opinion, that the inflammable air is formed from the phlogiston of the iron, united to a portion of undecomposed water, and not from hydrogene, the pretended radical of water.

He mentions that both finery cinder and massicot, are soluble in muriatic acid, without dephlogisticating it, as they ought to do if they contained oxygene, as minium does; and reasons, that if there is a principle in inflammable air, which, being imbibed by the calx of a metal, converts it into a metallic substance, the same principle must exist in charcoal and other combustible substances: that this is phlogiston, and is the same in them all.

The author objects to the correctness of the grand experiment for forming water from oxygenous and hydrogenous gases, and thinks the experimenters have suffered themselves to be deceived, and have imposed their deceptions upon the public; at least the experiments made by himself appear to him to be less liable to exception, and afford a result intirely different from that of the French philosophers; as evidence of this, he affirms roundly, that when the electrical spark is drawn through a mixture of dephlogisticated and inflammable airs, that a highly phlogisticated nitrous acid is produced, which acid is the stronger as the airs are more pure. Though he allows that dephlogisticated and phlogisticated airs will constitute nitrous acid too, and, consequently, both inflammable and phlogisticated airs contain the same principle, phlogiston.

The difference, in short, between Dr. P. and his opponents, on this point, is a matter of fact, wherein counter-experiments are brought forward by each party. The French academicians say, that hydrogenous and oxygenous airs, incorporated by drawing through them the electrical spark, turn to *water*; while our author declares they combine into *smoking nitrous acid*. The parties being here at issue, we suppose further experiments, and by other hands too, must be made to settle the controversy to our author's satisfaction.

Next follow four other objections to the antiphlogistic theory.

The first is drawn from the production of inflammable air when finery cinder is heated with charcoal; the second is derived from the production of fixed air or carbonic acid, in circumstances where not an atom of charcoal was present, and from the formation of it, during animal respiration, wherein if it be alledged to be formed from *carbone*, then carbone is but another word for *phlogiston;* the third is grounded upon the supposed proof, that azotic air is not a compound of azote and caloric, but of phlogiston and oxygenous gas; and the fourth proceeds from the persuasion Dr. P. possesses, that the new nomenclature is a premature publication. If it is intended as a language of science, the facts ought to be known, and the principles established, before appropriate names and terms are affixed to them. In this we agree with Dr. P. and are of opinion, that some parts of the nomenclature have been hastily, some parts incorrectly made out; and that they, at this moment, stand in need of amendment. But notwithstanding his objections, and those of the learned and scientific Keir, in the preface of his Dictionary of Chemistry, we have no hesitation to say, that we think the table of the new nomenclature a beautiful specimen of the analytic method, and an arrangement happily calculated to systematize and simplify the study of chemistry. It is a great outline chalked, and if any of the strokes are drawn wrong, they are the inadvertencies of a master, who, though he did not give the last and finishing touches to the piece, has left us, however, evidence enough that his design was a noble one, and his conception of it clear and strong.

How far the objections of Dr. P. are capable of being answered, will appear from the succeeding article, which will supercede the necessity of any further remarks on our own part at present.

ART. IV. *Reponse aux Reflexions sur la Doctrine du Phlogistique et sur la Decomposition de l'Eau: that is, Answer to the Reflections on the Doctrine of Phlogiston, and on the Decomposition of Water. By. P. A. Adet.* Philadelphia. *Moreau De St. Mery.* 8vo. 1797.

THIS is the performance we mentioned in the preceding article, as published by the Minister Plenipotentiary of the French Republic, between the time of his suspension from his public functions, and his departure from America; and we cannot but think he has usefully employed the interval of leisure which the jarring politics of the two governments afforded him. It too often happens, that public ministers are mere negociators and politicians, and when they are removed from their places, cease imme-

diately to attract or to deserve public regard. In Mr. Adet we have an exception, who no sooner ceases to represent his country in a diplomatic capacity than he undertakes to rectify what appear to be errors in science, and to establish chemical theory upon the unshaken basis of fact.

The answer, like the original piece, is divided into three chapters, in each of which Mr. A. replies specifically to the objections of his opponent.

The author, in the first chapter, on the constitution of metals, considers that the simplicity of metals, and their conversion to oxyds (or calces) by the absorption of oxygene, are already established upon experiments so decisive as to be wholly beyond the reach of dispute. The oxydation of quick-silver in open air, and its revification, without addition in close vessels, with a disengagement of oxygene, together with an increase of its weight in the first case, and a diminution of it in the second, corresponding to the weight of the oxygene, all point irresistibly to the conclusion, that the whole of the phenomena depended upon the fixation and extrication of oxygene. And this is not only true of mercurius precipitatus per se, but of the yellow oxyd of quick-silver, or turbith mineral. He affirms, contrary to Dr. Priestley's assertion, and on the authority of Monnet, Buquet, Lavoisier, and Fourcroy, that this very calx can be revived without addition, as also may the red oxyd of quick-silver by the nitrous acid, and all the other mercurial calces. And even if the calces required the addition of some substance to reduce them, this would be no proof of the existence of phlogiston, for all that could be said fairly, in that case, would be, that the oxygene in the different oxyds, adhered to the metal with different degrees of force, and in some of them so closely, that, not being capable of separation by heat alone, there is a necessity of adding some substance, for which the oxygene has a stronger attraction than it has for the metal.

Mr. A. denies that there is any proof of the addition of any part of the added substance (whether carbone, inflammable air, &c.) to the metal during its reduction. If any thing was added, it ought to be capable of detection by *weight*, but the balance gives *not* evidence of any such thing; and there are numberless cases where these oxyds are reduced to metals without addition of any thing, and consequently the assertion, that phlogiston enters into the constitution of metals, is wholly unsupported by experiment. Besides, how can the reduction of the nitrate of mercury be explained upon the hypothesis of phlogiston? On exposing this, or its red oxyd, to a sufficient heat, a great quantity of oxygene gas is obtained, and some azotic air. This latter, according to the antiphlogistic doctrine, comes from the nitrous acid, of

which it is one of the constituent parts. But, as Dr. Priestley says azotic air is composed of oxygenous gas and phlogiston, he must be puzzled to explain how the quick-silver, on its revival, does, in this case, not *take in*, but, on the contrary, *throw out* phlogiston.

Mr. A. on the authority of the experiments of Van Mons, contrary to the statement of Dr. Priestley, declares the red oxyd of mercury to afford oxygene air on its reduction; and declares, from his own experience, that minium, though newly made, affords a similar product.

The writer then proceeds to the consideration of the smell which iron is said to emit while it undergoes oxydation, and which is adduced as proof of a something emitted by the metal, which something is termed phlogiston; and this odour, he thinks, is peculiar to iron, or to its combination with oxygene, but observes, that further experiments are wanting on the subject, whether the phlogistic or antiphlogistic interpretation is attempted.

Mr. A.'s refutation of Dr. Priestley's idea, that inflammable air is composed of phlogiston and water (p. 50—52) appears to us very satisfactory; and no less conclusive his denial, that the azotic air, remaining in close vessels after the oxydation of iron, is, as Dr. Priestley affirms, produced by the phlogiston of the metal united to oxygenous air. Nothing is emitted from iron, nor from other metals, during their calcination; nor from sulphur, nor phosphorus, during their combustion, which, by its union with oxygenous, can change it to phlogisticated air.

In reply to the objections made to the extrication of hydrogenous gas, during metallic dissolutions, from the water rather than from the metal, Mr. A. has these remarks: "In fact, a metal, as it combines with acids only, when it is in a state of oxyd, and as it takes upon itself this form by the union of oxygene only, it must necessarily, as in the experiments mentioned by Lavoisier and La Place, absorb oxygene, in order to combine with an acid. But this oxygene can be furnished but by two substances, either the acid itself, or the water which it contains. If the oxygene had been afforded by the acid, this would in part have been decomposed, and, consequently, would have saturated less alkali after the experiment than before. But since it saturates afterwards as much alkali as ever, it is clear the acid has not been decomposed, and, consequently, the metal could have been supplied with its oxygene from no other source than the decompounded water."

As to the constitution of *finery cinder*, Mr. A. simply remarks, that it is a mere oxyd of iron, in which the oxygene is so closely connected with the metal, that the muriatic acid has not force enough to separate it.

In the second chapter, Mr. A. expresses his surprize that Dr.

Priestley should raise objections against the composition and decomposition of water, so often repeated and verified by the antiphlogistic chemists; and observes, that all the difficulties raised by our author have been answered already, over and over again, in the writings of the French philosophers. If their publications were to be got in America, he should have but to turn to the passages, and shew how satisfactorily these matters were explained. Circumstanced as he is, he attempts an elucidation of the subject without books: and, 1. He contends, that in causing water to pass through a red-hot gun-barrel, the iron becomes oxydated by the oxygene of the water; and if this oxyd should be incapable of reduction by caloric and light alone, but require the addition of carbone or hydrogene, this only follows from the greater attraction of the oxygene for the iron, in the first case, and is owing to its departure from the metal, and the formation of carbonic acid gas, or water, in the second. 2. Notwithstanding the difference which exists between the black oxyd of iron, produced by the decomposition of water, and the common red oxyd of the same metal, they are still both of them oxyds, for these reasons, that, like other oxyds, they both dissolve in acids without disengaging any thing, and metallic bodies are incapable of combining with acids unless they are previously united to oxygene. 3. Although there is some difference between this oxyd and the common red oxyd, it does not follow that they are not both oxyds; the difference between the two being only owing to the different circumstances under which they have combined with oxygene.

Mr. A. concludes that the whole of Dr. Priestly's objections to the decomposition of water, are capable of complete explanation without the phlogistic hypothesis.

As to the composition of water, our author considers his opponent's doctrine as little tenable. He maintains, that oxygenous and hydrogenous airs, exploded by the electric spark, form water, and not nitrous acid, as Dr. Priestley asserts. And renders it very probable, that in Dr. Priestley's experiments, whether he got his oxygenous air from manganese, minium or quick-silver, that there was a quantity of azotic air, afforded by the oxyds of those metals, together with the oxygenous air, which deceived him, and caused the different results which he speaks of.

The formation of fixed air is to be accounted for, from the carbone held in solution by the hydrogenous gas employed for the reduction of the *metals*.

There are other objections which Dr. Priestley might have brought forward, which Mr. A. thinks could have been as satisfactorily answered, but for further particulars he refers to the experiments of Berthollet.

The third chapter is allotted to the consideration of the remain-

ing objections to the antiphlogistic theory. If finery cinder is heated with charcoal, inflammable air is produced. Charcoal very commonly contains hydrogene; if so, mere heat may expel it.—Where it is declared, fixed air was produced from substances having not a particle of carbone, this must be founded in a mistake, or a misinterpretation of facts. The assertion that azotic gas is a composition of phlogiston and oxygenous air, is combatted with such force and success (p. 82—96) that we feel a persuasion, as well as Mr. A. that, among all the experiments and objections stated by Dr. Priestley, there are none which overthrow the theory of the antiphlogistians, or which invalidate the inferences drawn from their experiments.

ART. V. *An Inaugural Essay on the Yellow Fever, as it appeared in this City (New-York) in* 1795, *&c.* By Alexander Hosack, jun. A. M. of New-York. New-York. *T. and J. Swords.* 1797. 8vo. pp. 40.

THE importance of obtaining correct ideas of the nature and cure of so formidable a disease as the YELLOW FEVER, from which the United States have lately suffered so severely, and which is likely to continue its ravages in our country, induces us to consider the publication before us with a greater degree of minuteness and attention than we suppose generally due to Inaugural Dissertations on practical subjects. We are the more encouraged to an examination of this Essay, as the author informs us, in his preface, that he has "confined himself to what fell under his own observation, in his attendance at the New-York Hospital, and upon the "private practice of Dr. Samuel Bard and his brother, Dr. David "Hosack." So that we are to regard it as a summary view of their experience and practice in the fever of 1795.

Mr. Hosack first delivers a succinct and correct account of the general appearance and progress of the disease, not materially varying from other histories of it, and therefore not necessary to be quoted. He concurs with preceding writers in affirming, that "it is certain that those who most indulged in the use of animal food and spirituous drinks were most succeptible of the disease"—a fact that can scarcely be too often or too strongly impressed on the public mind. But we do not think him equally correct in representing the state of convalescence as so universally tedious and protracted. We are rather inclined to believe that, except in some very peculiar cases, this depended chiefly on the treatment of the disease. Where suitable means were promptly and freely employed in the beginning, the recovery, so far as our

experience extended, was rapid; where they were long delayed, or partially applied at first, recovery was proportionately slow.

The Predisposing and Exciting Causes are judiciously assigned. Concerning the *first*, however, it may be doubted whether the use of camphor, &c. as preventatives, did not rather favour the operation of the disease, by exciting a constant attention to its progress, and by stimulating the absorbents of the nostrils, and promoting the ready inhalation of the morbid effluvia, in places where they abounded; and whether bleeding, purging, and a scanty diet, were followed by any mischievous effects. The current of popular opinion, unfortunately, ran too strongly the contrary way. Numbers, unquestionably, precipitated themselves, by improper indulgencies, into those sufferings from which they might have escaped by the use of a diet less stimulant than ordinary, and a moderate and occasional use of laxatives.

From the consideration of the exciting cause, Mr. Hosack proceeds to the *cure* of yellow fever. This he treats of under four indications—"1st. To prevent the further operation of the poi-"son producing the disease. 2dly. To procure a solution of the "inflammatory stage of the fever. 3dly. To counteract the pu-"trescent state of the body, as described in the second stage of "the disease. And, *lastly*, to restore the tone of the system when "the preceding indications are accomplished."

Under the *first* head, Mr. H. recommends the removal of the sick into pure air, and a careful attention to cleanliness.

Under the *second* indication, he treats of bleeding, purging, vomiting, sweating, and the cold bath; all of which being topics of great importance, on which there has been much discussion, and continues to be variety of opinion, we may be excused for some prolixity, especially as we do not always coincide with Mr. H. either as to fact or reasoning.

With respect to *bleeding*, Mr. H. remarks—"my observation "has been, that the promiscuous use of the lancet was very inju-"rious and unsuccessful. In the New-York hospital it was fre-"quently employed, but in the majority of cases the disease ter-"minated fatally." In reply to this censure of venæsection, we may observe, in the author's words, that "the abuse of a remedy "is no argument against its use;" nor, we may add, is the fatal event of the case in which it was used any proof of its inutility, or that it was pernicious. To determine on the propriety or impropriety of the administration of a proposed remedy, it is necessary to know not only that it has been used, but to what degree, and under what circumstances. "The promiscuous use of the "lancet"—if by this is meant the use of it without regard to circumstance, must undoubtedly be "injurious and unsuccessful." The same may be safely predicated of all other active remedies,

how safe and certain soever in the hands of a judicious practitioner. The particular application of this remark to the lancet, therefore, conveys no precise information. Nor shall we find the argument against it much strengthened by what is said of its failure in the hospital, when the assertion, which is far too general, comes to be examined. Patients, it is well known, were received into that Charity in all stages of the disease. In some instances they died before any efforts could be made for their effectual relief: in many others, where there was but little reason to expect their recovery. In these circumstances, and when it is recollected that nearly half of all who were admitted for fever fell victims to it; that one of the gentlemen in attendance never bled, or, if ever, very rarely; and that his respectable colleague, the present Clinical Professor, directed venæsection in not more than six or seven cases, and in small quantities in every instance, from an apprehension not then subdued, as he very candidly acknowledged, of the consequences—an apprehension which subsequent experience has well corrected:—When these facts are recollected, the event of so few cases, even if fatal, with so limited a use of the lancet, can hardly justify the strong and decisive language of the Essay under review. It may be added, that the practice of gentlemen opposed to bloodletting, and therfore seldom prescribing it, whose professional walk led them principally among the more opulent part of the community, who were natives of the city, and were surrounded by all the conveniencies of life, and in whom many circumstances concurred to render the fever comparatively mild, was by no means the best opportunity of judging of the efficacy and necessity for this remedy. Among the emigrant poor, who were the principal sufferers, the disease was far more ferocious. In their dark and dismal receptacles, in the midst of squalid poverty and neglectful intemperance, by their deserted or crowded beds, it displayed all its virulence, and accumulated all its horrors. A vigorous and prompt method of cure was indispensable; and the oral as well as printed testimony of many physicians in this city, who had the best opportunities for observation, should long since have removed all doubt as to the propriety of bleeding, in the first stage, at least, of all severe cases of yellow fever. And so far from its being probable that the use of the lancet was injurious in those cases where Mr. H. saw it employed, and where the event was unfortunate, it is much to be suspected that this event was the consequence of a too timid exercise of it, or of the subsequent administration of medicines whose operation tended to counteract its efficacy.

Mr. H. having, as we have seen above, entered a caveat against venæsection, proceeds to detail what he denominates "the more "common and successful practice." We shall not stop to con-

trovert the assertion, that the method of cure he proposes was "the most common and successful," but shall rather examine in what it consists. And this we find to be,

"1st. To procure a free evacuation from the bowels"—and for this purpose the author particularly recommends Glauber's salts, "which," he says, "was the most successful, and acquired "the greatest reputation." It is, no doubt, one of the primary objects of the physician to obtain a free passage through the intestinal canal, in yellow fever; and to effect this as gently, and preserve it as steadily, as possible; but we are wholly ignorant that the purgative medicine, here so much extolled, acquired any peculiar reputation, or was peculiarly successful. We should not have descended to a criticism so minute, but that it seems proper (without questioning the author's accuracy of observation) to caution inexperienced readers not to rely too much upon it. The nauseous taste of Glauber's salts, which often, under the most favourable circumstances, offends the stomach, appears to render them particularly objectionable in a disease where that organ is so easily affected, and where vomiting, by whatever means excited, is so difficult to allay, and so pernicious in its effects.—The impropriety of administering emetics is not only admitted, but well stated, by Mr. H. himself, when he comes to consider the course to be pursued after evacuating the bowels, which is, he continues,

"2d. To relax the surface of the body, and induce free perspi-"ration." For this purpose, some, he says, had recourse to emetics, a practice which, as we have before remarked, Mr. H. censures, and in terms that deserve to be quoted. "Vomiting, in "this disease, I have generally observed to be of dangerous ten-"dency. It may, perhaps, not be amiss, when the disease first dis-"covers itself, and is attended with much sickness and vomiting, "to empty the stomach freely, by means of an infusion of cha-"momile flowers; but the exhibition of emetics I consider to be "highly dangerous and improper. I believe I have seen some "cases in which the death of the patient could be ascribed to no "other cause than the incessant vomiting brought on by an eme-"tic given in the commencement of the disease." Of this we have no doubt; melancholy proof having been, more than once, presented to our own eyes; and we hope this fact, so well established, may have some influence in restraining practitioners of medicine from the general administration of emetics, in the beginning of our own country fevers, at least, and emancipate them from a servile acquiescence in the opinions of Dr. Cullen, and some other celebrated European writers.

Of the advantages to be derived from Sudorifics, or from sweating procured by art (to say nothing of the difficulty of effecting it by such means, while the violent action of the arteries is yet

unsubdued) in this disease, so warmly advised by Mr. H. we must be permitted to retain our doubts; not having seen any thing ourselves, or found much in the writings of others, to confirm us in the belief of their utility. Indeed, we much fear that there has been great misapprehension on this subject of sweating; but our limits do not permit us to enter into the discussion at present. We may, however, observe, that profuse sweats have been known to occur in yellow fever, without producing any salutary change in the patient; an event which could scarcely be expected, were Mr. H.'s notions of the consequences of this discharge altogether as just as he seems to suppose.

But though we are cautious how we assent to *all* the means prescribed by Mr. H. we heartily concur with him in recommending the cold bath, or frequent washings of the body with water, or vinegar and water. The practice, however, deserves to be stated with more precision than even Mr. H. has exercised; because, we are well convinced, many and great evils have resulted from an improper and ill-timed application of this remedy, and that it may be employed, if judiciously, in almost every state of the disease, with advantage.

If, in the first days of the fever, cold water be thrown on the patient, we have observed the following effects. First, the pulse was reduced in frequency and force; a general and pleasant coolness was induced over the whole system; and pain was very much mitigated, if not removed. This state of things has continued for some time, greater or less, according to the extent to which the cold affusions were carried, and to other circumstances. Afterward the heat, fever, and pain, gradually returned, till, at length, they became more severe and intolerable than at first. The reason of this no one will be at a loss to conceive who has perused the writings of Brown, Darwin, Hunter, and Rush. Where the like practice has been pursued, towards the close of the disease, we have never remarked any more than a slight and temporary return of warmth. More often the skin has continued cold; and we have been certain that such a torpor of the system has been induced, as has aided the progress of the disease. On the contrary, when, in the first days of the fever, while the heat was great, the pulse strong, and the strength of the body not yet reduced, we have noticed that a gradual application of cool, or even cold water, so that the whole body should be washed, has had very happy effects; especially if persevered in, and frequently repeated. Like beneficial consequences result from similar applications, similarly conducted, toward the close of the disease, if the morbid heat of the skin continue. Nor is it of great importance whether the water be cool or tepid, if the patient be freely exposed to the air. The subsequent evaporation of tepid water probably will not

fall short, in point of benefit to the patient, of the original application of that which is cold. In either case the skin is cleansed of all unpleasant and unsalutary matters; is refreshed by a gentle coolness; the strong pulse of the first stage is diminished in force, the weak pulse of the last stage in frequency; a tendency to sleep is often induced; and perspiration, or sweating, follows as the natural and inevitable consequence of the removal of the morbid heat from the surface of the body. That this is the fact, whether the fever be inflammatory or putrid (to use the ordinary terms of medical writers) is confirmed by the experience of those who have written from a careful attention to facts happening under their own eyes.—But to proceed—When, in the beginning of the fever, the head or the stomach is peculiarly affected, at the same time that the gradual application above mentioned is made to the body *generally*, cold may be *particularly* applied to the suffering part, with great advantage. In this case it should be constant; and very cold water, or ice, is requisite: to the shaved head, if the head be affected; and to the region of the stomach, or by the mouth, if the stomach.

There will sometimes occur, pretty early in the fever, in feeble persons, and where the evacuations have been considerable, a sudden diminution of warmth over the whole body—chilliness, perhaps, and coldness of the lower extremities; while the pain and heat of the head are the same, or are increased. In such cases, warm applications to the feet and legs, with the continuance of cold to the head, have never, according to our observation, failed of good effects.

There is one situation further to be particularized, in which cold applications externally are adviseable. When the inflammatory symptoms of the disease have been obviated by free evacuation, and, as sometimes happens, things seem inclined to remain stationary for a time, we believe that the *shower-bath* may be advantageously employed, if not too long continued. In this case the application of cold has a tendency to accumulate the excitability, or irritability, or sensorial power, by which the skin is rendered more sensible to the impress of the natural stimuli, and more readily resumes its healthy action.

Physicians, in many instances, have persevered in cold applications, in this fever, with too little discrimination. In the last stage of the disease, the whole body, perhaps, except the epigastric region, or the abdomen, will be cold, the head much affected with delirium or coma, and cold applications still persisted in. In this situation of the patient, no benefit, but much injury, must result from their continuance. Wherever morbid heat is observed, there they are proper; but whatever part of the system is much below the standard of healthy heat, requires the careful ap-

plication of warmth. There is nothing peculiar in yellow fever, in this respect, which should overthrow, or cause us to disregard, the general principles which govern us in the treatment of diseases. And it is because some appear to think so, and because the consequences of such a persuasion have been so unfortunate, that we have entered so largely into the consideration of the subject, on the present occasion—as we hope, neither uselessly nor impertinently.

We come now to the *third* indication of cure, which arises when the yellow fever has progressed to what Mr. H. calls the second or putrescent stage of the disease; from which, he observes, few patients recovered.

Without entering into a lengthy examination of particulars, we may observe, that the practice recommended in this stage of the disease could only be successful in its mildest form; nor can we wonder that few patients, who were violently affected, should recover by its means. In respect to blisters, we heartily concur with Mr. H. in recommending their application over the stomach, under the circumstances he mentions; having sometimes seen them arrest vomiting when it had not proceeded to very great lengths; but we must regard them as an equivocal remedy in the advanced stages of the complaint. Perhaps, in cases where there is much congestion, and in the commencement of the disease, after free and repeated evacuations, they might be employed with more success, on the same principle which determines their use in pneumonia. We are at a loss, however, to discover the reason why Mr. H or his instructors, have so wholly passed over and left unemployed the lancet, in a condition of the disease from which, under their common practice, so few recovered; especially when Dr. Rush, and other practitioners of great experience, have borne such ample testimony in favour of its efficacy in restraining those dreadful vomitings that occur in the yellow fever. Equally surprizing is it that no mention is made of calomel and other mercurials, which Mr. Chisholm, Mr. Boag, and the East and West-India physicians in general, represent as nearly a specific in the worst forms of the disease, in those countries; and which Dr. Rush, and others of our countrymen, in Philadelphia, New-York, and New-Haven, have so successfully administered.

We intirely coincide with the author in the caution against the use of wine, bark, &c. in this stage (and all stages) of the fever; and, if we except the addition of spirits, &c. to the patient's drinks and food, agree with him in the general plan of diet.

Under the *last* indication, for restoring strength to the patient, after the solution of the fever, we see little to except against, and much to commend. We have not, it is true, found any particular advantage from bark and wine, even here; but we have ob-

served the best effects from the avoidance of meats, and the sparing use of animal food, in every form. The remarks of Mr. H. on this point, are judicious and just, and prove him to have observed with a degree of accuracy much to his credit.

We have now gone through with our examination of this Essay, on which we have bestowed the more time and attention, as we found some errors the more necessary to be corrected, as they are mingled with interesting truths; and as the subject treated of is of increasing importance.—In respect to the cure of yellow fever, generally speaking, we seem not to have attained, as yet, to that clear, decisive, and prompt method, which shall be always and unequivocally safe and certain. The subject is still embarrassed with doubts and difficulties; and though the disease seems willing enough to afford us opportunities for observing and combatting it, yet, while any uncertainty remains as to the best weapons wherewith to oppose it, the public are much indebted to every person who will step forward and promote discussion concerning them. Nor will the sincere lover of truth, and friend to his fellow men, find any cause for complaint if those which are effectual are contrived, with the overthrow of all his own opinions and speculations, however fondly they may have been cherished and ingeniously devised.

ART. VI. *An Inaugural Dissertation on the Operation of Pestilential Fluids upon the large Intestines, termed by Nosologists Dysentery.* By *William Bay*, Citizen of the State of New-York. New-York. *T. and J. Swords.* 1797. 8vo. pp. 109.

IT is proper to apprize the reader, that the leading principles of this Dissertation are founded on the doctrine of pestilential fluids, which has been taught, for some time past, by the Professor of Chemistry in Columbia College.

In the introduction, Mr. Bay takes notice of an erroneous opinion, too often entertained by physicians, that diseases arising from the exhalations of animal and vegetable substances, during corruption, are putrid. Such persons have not considered the antiputrescent qualities of the vapours emanating from substances undergoing the putrefactive process. Carbonic acid gas, nitric acid, and volatile alkali, always extricated in greater or less quantity during putrefaction, are known to be powerful preventives of corruption. To assert that the products of putrefaction possess a power to putrefy every thing near them, would be just as reasonable as to affirm that the products of combustion set fire to every thing with which they come in contact. Substances hav-

ing undergone combustion are ever afterwards incombustible; and bodies, whose connection has been dissolved by putrefaction, are ever afterwards antiseptic. The well-known experiments of Dr. Alexander leave no doubt on this subject.

This Dissertation is divided into three chapters; the first describes the functions of the alimentary canal; the second treats more particularly of the disease; and the third delivers the doctrine of pestilential fluids, which the author applies to explain the phenomena of dysentery.

On the subject of digestion, the usual arguments are adduced to prove, that trituration, fermentation, and putrefaction, possess no agency in that operation, and that to the solvent powers of the gastric liquor we are to look for the principal cause of the decomposition, which aliment undergoes in the stomach. The experiments of Spallanzani, Reaumur, Hunter, and Steevens, so far as is necessary to establish this point, are briefly stated.

The properties and use of the bile next engage our author's attention. Having exhibited a short view of the structure and functions of the liver, he proceeds to describe the ordinary appearances of the bile, and the products it yields on being subjected to distillation. These are stated, on the authority of Fourcroy, to consist of "a yellow alkaline phlegm, an empyreumatic oil, a "considerable quantity of the carbonate of ammonia, an elastic "fluid united with carbonic and hydrogene gas, and the carbonate "of soda." Rejecting the opinion of the agency of bile in aid of digestion, by means of its saponaceous, blending qualities, he concludes, "that the principal use of it in the animal economy, "is to prevent diseases arising from the putrefaction of animal "and vegetable matter." Supposing the spontaneous decomposition of these matters to yield nitric acid or azotic oxyd, which he considers as the parents of a multitude of diseases, he thinks the alkaline qualities of the bile well calculated to neutralize and destroy them. He asserts, that the blame thrown on the bile, as tending to become acrimonious and putrid, and thereby generating the summer and autumnal diseases, is altogether unfounded; and that, on the contrary, the large quantity of it produced in the diseases called bilious, is a bountiful provision of nature to counteract the pernicious matter which forms the real cause of such fevers.

That putrefaction takes place in the feculent matter of the large intestines, Mr. Bay concludes from the existence in these tubes of all the circumstances necessary to produce this effect, viz. air, heat, moisture, the matters most apt to be wrought upon by such causes, and the slowness of motion requisite for their full operation; and also from the quantity and quality of gazeous fluids emitted from the rectum. Animal diet must, he thinks, greatly increase the mischief of this decomposition, as the lean part con-

tains a large proportion of azote, and no small quantity of oxygene, the two principles from whose union he apprehends so much danger. The fat part, on the other hand, chiefly consisting of carbone and hydrogene, seems to be innocent.

From a chemical analysis of the fæces, it appears, our author informs us, that they emit *hydrogene gas*, *sulphurated hydrogene gas*, *phosphorated hydrogene gas*, *carbonic acid gas*, and *azotic gas*. None of these gases, nor any combination of them yet known, produce mischievous effects. Hydrogene gas alone is perfectly innocent: combined with carbone, it forms fat; with oxygene, water; with azote, ammonia. Carbonic acid gas and azotic gas constantly exist in the human constitution, and, in moderate quantity, are found to be intirely harmless.

Having found these gases insufficient to produce dysentery, Mr. B. concludes that a chemical combination of azote and oxygene, forming, according to the degree of oxygenation, either an oxyd of azote, or the nitric acid, constitutes the morbid cause in question. He supposes this to be rendered probable by the animal origin of the nitric acid—by the large quantity of animal matter taken in as food—by the use of the fæces in the formation of nitre—by Pringle's observation of an acid existing in the fæces—by the increase of the fœtor of feculent matter, from the addition of nitric acid, as observed by Pringle—and by Homberg's fact of a salt, discovered in the fæces of a man fed upon coarse bread, which, when exposed to fire, detonated like nitre.

The noxious fluid, thus formed by a chemical union of azote and oxygene, our author asserts, may be either generated in the large intestines, and immediately produce dysentery by coming in contact with their coats, or arising from the immense masses of putrefaction, which overspread so large a portion of the earth, in the form of vapour, it may be introduced into the bodies of men by the lungs, by the stomach, or by the pores of the skin, and, in this manner, produce the same disease. This difference, as to the source of the morbid cause, will readily account for the sporadic, endemic and epidemic appearances of dysentery.

From the concurring testimony of a number of the most eminent medical writers, the connection of this disease with remittent and intermittent fevers, is easily evinced; and hence their origin from the same cause may be inferred with great probability.

The means of preventing the disease next employ our author's attention; and these he refers to three heads. 1. He enjoins abstinence from all animal food, except its oils and fats, whenever the disease is prevalent; 2. He directs to avoid costiveness; and, 3. He orders removal from an infected atmosphere.

The method of cure is distributed into the three following indications—" 1st. To remove septic and feculent matter from the

alimentary canal: 2d. To correct the vitiated state of the atmosphere, or to remove from it: 3d. To allay the inflammation, and the other injuries, which the alimentary canal may have sustained by the original cause of the disease, and the remedies made use of to effect a cure."

The first indication is promoted by freely evacuating the intestines. For this purpose the author recommends carbonate of pot-ash (salt of wormwood), acetite of pot-ash (regenerated tartar), sulphite of pot-ash (vitriolated tartar), tartrite of pot-ash (soluble tartar), tartrite of soda (Rochelle salt). As these salts are all decompounded by the nitric acid, their alkaline bases will serve to neutralize it. The muriate of soda (common sea salt) united with the vegetable acids, has been also much commended. Carbonate of pot-ash is directed to be given in doses of four grains, every two or three hours; and it is advised to combine it with jalap or rhubarb, when these are chosen as cathartics. Oleum ricini and the cerated glass of antimony are also recommended; and to relieve the tenesmus, starch-clysters, with tincture of opium, are directed to be injected.

For the purpose of cleansing the body externally, and, at the same time, reducing the temperature when too much heated, as well as promoting a diaphoresis, the cold bath is ordered to be employed.

To correct the vitiated atmosphere surrounding the patient, the chamber is directed to be ventilated and frequently changed, the floors to be cleaned with alkaline ley, and the walls to be white-washed with lime. The bed-clothes and body-linen of the sick should also be often changed. And if by these means it be not possible to correct the vitiated air, it will become necessary to remove the patient to a healthier situation.

To accomplish the third indication, blood-letting is principally relied on, which is advised to be small, and to be frequently repeated.

The diet of the sick is ordered to consist of soups, milk, and vegetable substances: the lean parts of animals are forbidden. And, at the close of the disease, the usual corroborant remedies, such as bitters and the Peruvian bark, are recommended.*

We have thus drawn a brief outline of this Dissertation, which

* Mr. B. has omitted to recommend mercury in his plan of treating dysentery. In the more severe or protracted cases of the disease, when the ordinary remedies have failed, and when violent degrees of inflammation or ulceration of the larger intestines are either threatened or supposed actually to have taken place, we know no remedy so much to be relied on as calomel, combined with small quantities of opium, till it gently touches the mouth, in the manner directed by Dr. Clark. *See Observations on the Diseases which prevail in long Voyages to hot Climates*, p. 340.

contains matter deserving the serious consideration of every practitioner of medicine. We regret that our limits do not permit us to notice much of the reasoning and illustration employed by Mr. B. to vindicate and confirm his principles.

But as many doubts are still entertained concerning the doctrine maintained in this essay, it now becomes our duty to state these with all possible impartiality.

The acknowledged connection of dysentery with remittent and intermittent fevers, while it favours the opinion of their origin from a common source, has been thought to expose Mr. B.'s hypothesis of the generation of the former disease in the large intestines, to an obvious objection. In these fevers it commonly happens that bile is secreted and poured into the alimentary canal in large quantity; but this fluid, from its strong alkaline property, is the direct neutralizer and extinguisher of the noxious matter supposed to produce dysentery. How happens it then, that, in such circumstances, the system should manifest such tendency to fall into dysentery, notwithstanding the immediate presence and operation of so large a quantity of its direct antidote? In jaundice, when the fæces are deprived of the neutralizing benefit of the bile, and when costiveness often detains them a long time in the large intestines, exposed to all the hazard of the evolution of this poison, dysentery is not observed to take place.

The infrequency of sporadic dysentery has been also made a ground of objection to this doctrine. The circumstances leading to putrefaction must be supposed always, more or less, to exist in the large intestines, viz. heat, moisture, air, and a quantity of animal and vegetable matter. The degree of heat in the intestines may be considered as nearly at the same point in all seasons and in all climates. Indigestion, and other causes weakening the assimilating powers of the alimentary canal, and giving occasion to the evolution of such noxious matters as the process of corruption is apt to generate, often occur. Sporadic dysentery, from this internal poison, on these principles, should be frequently expected; and yet it is seldom observed, except where season, climate, particular states of the air, or other similar causes exist, which are likely to furnish the noxious matter that appears to gain admittance, from without, into the system.

It has been likewise objected to Mr. B.'s doctrine, that various cathartic remedies, and particularly the sulphates of soda and magnesia (Glauber's and Epsom salts) have, from actual experience, produced equal, if not superior, good effects in dysentery, to the saline articles that are decompounded by the nitric acid, and, on that account, according to his principles, ought to operate in a much more powerful manner.

In opposition to the theory supported in this essay stand the experiments of Dr. Carmichael Smyth, who, on board the Union hospital-ship, at Sheerness, found the fumes of nitrous acid a successful means not only of destroying the offensive smell of putrid animal effluvia, but also of extinguishing contagion.

On ground not very dissimilar rests an objection drawn from the employment of nitrous acid, by Mr. Scott and others, as a remedy in hepatic and other diseases of the abdominal viscera, and in syphilitic affections. From these cases it appears that this active substance has been daily taken, in considerable quantity, into the stomach, for some length of time, and generally with great advantage.

" The nitrat of silver, or lunar caustic, is mentioned by Mr. Hahnemann as a most effectual antiseptic: he says, that flesh laid in a solution of one part of this nitrat in five hundred of water, will not putrefy; and if, after being kept a fortnight in a strong solution, the flesh be taken out, and laid in a warm place, it will be gradually dried, without contracting the least disagreeable smell, will become very hard, and will never breed maggots. He asserts also, that water, in which a very small proportion of this nitrat is dissolved, will remain perfectly sweet, provided it be kept from sunshine, which would cause the nitrat to precipitate. The water is perfectly innocent, may be used as a common drink, and may be peculiarly advantageous at sea, as a preservative against the scurvy." Appendix to Monthly Review, vol. xiv.

The engraver, whose etching on copper is performed by means of nitrous acid, must be greatly exposed to inhale, or otherwise receive, the nitrous gas evaporating from the plate: yet we have never understood that these artists experience any thing like pestilential injury from breathing over this vapour. Silver-smiths, and some other workers in metals, who employ aqua-fortis in their operations, present facts of similar import.

How far these experiments and facts should be admitted to invalidate the theory delivered in this Dissertation, we shall not undertake to decide, but shall willingly submit them to the test of further time and experience. Whatever variety of opinion or discordancy of facts may exist on this subject, we are persuaded the most perfect unanimity will prevail in considering the principles here delivered by Mr. B. and supported by so many powerful arguments, as highly interesting to the science of medicine and to the welfare of mankind. And we are convinced the same unanimity will be felt in ascribing to our author the praise of diligence, ingenuity, and a comprehensive survey of the subject on which he treats. This early fruit of his studies, worthy of a more advanced age and mature experience, leaves us no room to doubt that his future professional career will be honourable to himself, and useful to his country.

ART VII. *An Inaugural Dissertation on that Grade of the Intestinal State of Fever known by the Name of Dysentery.* By *James Fisher*, of Delaware, *&c.* Philadelphia. *Ormrod and Conrad.* 8vo. pp. 52. 1797.

THE Essay before us exhibits honourable testimony in favour of the ingenuity and industry of the author. It may be questioned, however, whether his speculations have contributed any thing to the illustration of the nature of the disease, or the treatment recommended by him to its cure, of which the public was not already possessed. Still, as many sensible remarks and judicious directions are here collected, in a compact form, it may not be an unpleasing nor unuseful task, especially to the young physician, to refresh his memory by the perusal of Mr. Fisher's Dissertation. But, when we have acknowledged that, in this point of view, we have derived some pleasure from the reading, and, on the whole, consider this performance as creditable to the writer, we may be allowed to offer a few suggestions to him, as matter of future reflection and inquiry, in the course of the practical application of those studies the collegiate pursuit of which he has just concluded.

With respect to what is said concerning the dysentery being only a *febris introversa*, it may be remarked, that the general line of argument pursued here, would reach to almost every disease not absolutely local, and comprehend the most opposite states of the system. And if it be insisted that this is the fact, and that all general diseases are fevers of various forms and degrees, we have yet to discover the practical utility of such an opinion. The necessity will recur as strong as ever for particular description and careful discrimination. This being the case, it would, perhaps, be more useful and more accurate to say, that the state of the bowels which we call dysentery, is accompanied by fever, or that fever constitutes one of the essential parts of the disease. Even then we should not have a very distinct conception of the fact without some further and more precise account of the nature of the fever.

So, in regard to what Mr. F. considers as the remote causes of dysentery, viz. marsh-miasmata and contagion, it may admit of doubt whether he has viewed the subject with philosophic accuracy—whether unity of effect does not bespeak unity of cause—whether there is any specific difference between the infectious material which rises from marshes, and that generated in the intestines—and whether this material, or principle, or whatever it may be denominated, be not rather the *exciting* than the *remote* cause of dysentery.

The old notion of the mischiefs arising from the checkage of perspiration, that yet surviving offspring or progenitor of the humoral pathology, should not have found its way into a modern Dissertation, in which effects ought to be more carefully distinguished from causes.

But these are, comparatively, slight defects, and after all depend much on opinion. In the more material part, the Cure, Mr. F. has carefully collected and arranged the various remedies whose efficacy has been ascertained by the experience of his predecessors, with brief and general rules for their exhibition, it is true, and such, perhaps, as future practice may teach him somewhat to vary, but more correct and particular than are often to be found in Inaugural Essays.

ART. VIII. *An Inaugural Dissertation on the Dysentery.* By *Colin M'Kenzie*, of Baltimore, *&c.* Philadelphia. *Ormrod and Conrad.* 8vo. pp. 47. 1797.

MR. M'KENZIE pursues nearly the same course with his fellow-student, Mr. Fisher. We often recognize not merely the same opinions, but almost the same words, in either essay. These resemblances have probably arisen from attending the instructions of the same teachers, and from frequent interchange of sentiments with each other. The mode of cure proposed by Mr. M. does not differ materially from that laid down by Mr. Fisher.—On the whole, we think Mr. Fisher's Dissertation deserves the preference.

ART. IX. *An Inaugural Dissertation on Hydrocele.* By *Samuel Jones*, A. M. *&c.* Philadelphia. *Ustick.* 8vo. pp. 27. 1797.

THIS is a short, but comprehensive and well-written Essay. We intirely agree with Mr. Jones in the opinion that Mr. Earle's method of effecting the radical cure in hydrocele, by *injection*, is preferable to any other yet proposed.

ART. X. *An Inaugural Dissertation on the Rheumatic State of Fever.* By *Edward North*, of South-Carolina, &c. Philadelphia. *Woodward.* 8vo. pp. 37. 1797.

IT is sufficient to give the title of this Essay, which, relating to a very common disease, and presenting no new views of the subject, will probably never be consulted by the practitioner or the theorist.

ART. XI. *An Inaugural Essay on Dropsy, or the Hydropic State of Fever.* By *William Allston*, of George-Town (S. C.) &c. Philadelphia. *Woodward.* 8vo. pp. 60. 1797.

MR. ALLSTON adopts the theory of Dr. Rush in respect to dropsy—a theory which those of our readers who may not already be acquainted with it, will find ably developed in vol. ii. of that gentleman's *Medical Observations and Inquiries.* To the merit of originality, therefore, the author of the present Essay can prefer no claim; but we may remark that he has multiplied authorities, in favour of his hypothesis, in a manner which displays considerable reading and reflection. Those who are accustomed to Dr. Rush's manner of treating a subject, will observe, that the pupil has preserved, with great fidelity, both the method and turn of expression of the preceptor. This circumstance may be a further recommendation of Mr. A.'s Dissertation to notice, which, from its general merit, it well deserves.

METEOROLOGICAL OBSERVATIONS *for July*, 1797, *made by* GARDINER BAKER, *in the Cupola of the Exchange in the City of* New-York.

Days of the Mon.	Thermom. obſerved at Sun-riſe.	3 P. M.	Prevail. winds. 5 M.	3 E.	Clear.	Cloudy.	Barometer obſerved at Sun-riſe.	3 P. M.
1	69	77	S W	S	2		29 72	29 62
2	72	89	S W	S W	1	1	29 50	29 45
3	73	80	S	S	2		29 50	29 54
4	70	82	W	W	2		29 58	29 70
5	64	84	N W	N W	2		29 75	29 76
6	67	85	S W	S W	2		29 79	29 78
7	70	76	S	S		2	29 73	29 65
8	70	73	S E	S E		2	29 55	29 42
9	71	85	S	N E	1	1	29 57	29 40
10	70	89	N	S	2		29 50	29 55
11	70	84	E	S	1	1	29 54	29 58
12	68	83	N	N W	2		29 67	29 68
13	72	85	N	S W	2		29 70	29 75
14	71	82	S	S	2		29 77	29 73
15	72	85	S W	S	1	1	29 69	29 60
16	70	85	N W	W	2		29 56	29 56
17	73	77	S E	S E		2	29 55	29 60
18	70	81	N E	S E	2		29 67	29 73
19	69	88	N W	N E	2		29 71	29 72
20	74	90	N E	S	2		29 75	29 78
21	76	90	W	S	2		29 81	29 81
22	73	85	W	S	1	1	29 78	29 75
23	74	80	S	S	1	1	29 65	29 63
24	71	83	E	S E	2		29 53	29 46
25	74	74	S	N	2		29 34	29 35
26	70	86	N W	N W	2		29 48	29 58
27	73	81	S W	S	1	1	29 70	29 73
28	69	80	E	N E	1	1	29 70	29 69
29	70	82	N E	E	2		29 69	29 71
30	71	80	E	S W	2		29 72	29 72
31	71	77	E	S E	1	1	29 72	29 72

Results of Meteorological Observations for July, 1797.

Mean temperature of the Thermometer at ſun-riſe, deg. 70 8 hund.
Do. do. of the do. at 3 P. M. 82 5
Do. do. of the do. for the whole month, 76 6
Greateſt monthly range, between the 6th and 21ſt, 26 0
Do. do. in 24 hours, on the 10th, 19 0
Six days it rained, and a conſiderable quantity has fallen.
Five days it thundered and lightned, but not in great abundance.
Coldeſt day the 5th. Warmeſt day the 21ſt.

METEOROLOGICAL OBSERVATIONS *for August*, 1797.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. 5 M.	2 E.	Clear.	Cloudy	Barometer observed at Sun-rise.	2 P. M.
1	70	77	E	N E		2	29 60	29 61
2	70	75	E	N E		2	29 65	29 72
3	70	73	E	E		2	29 77	29 79
4	70	71	E	E		2	29 76	29 70
5	75	80	S E	S E	1	1	29 51	29 68
6	71	78	W	N W	1	1	29 71	29 68
7	70	79	N	N	1	1	29 68	29 73
8	71	73	E	S E		2	29 60	29 42
9	69	81	S W	S W	2		29 45	29 51
10	65	78	N W	W	2		29 76	29 82
11	65	76	N E	S	2		30 08	29 90
12	67	75	S	S	1	1	29 87	29 75
13	73	81	S	S W	1	1	29 50	29 45
14	65	74	W	N W	2		29 53	29 59
15	56	76	N W	W	2		29 80	29 80
16	62	77			2		29 87	29 88
17	65	78	S W	S	2		29 90	29 84
18	70	79	S	S	1	1	29 69	29 60
19	68	81	S	S W	2		29 35	29 32
20	68	81	W	S W	2		29 33	29 41
21	67	77	N E	S W	1	1	29 51	29 53
22	71	71	E	E		2	29 57	29 60
23	66	76	N E	N E	2		29 58	29 53
24	67	82	S W	S W	2		29 54	29 54
25	68	77	E	S E	2		29 54	29 58
26	72	78	S	S	1	1	29 72	29 76
27	66	76	N W	S W	2		29 52	29 49
28	66	78	N W	N W	2		29 57	29 57
29	61	74	N W	W	2		29 70	29 70
30	64	71	E	S E		2	29 75	29 78
31	67	75	E	S E		2	29 80	29 80

Results of Meteorological Observations for August, 1797.

Mean temperature of the Thermometer at sunrise,	deg. 67 5 hund.
Do. do. of the do. at 2 P. M.	78 6
Do. do. for the whole month	72 5
Greateſt monthly range, between the 15th and 24th,	26 0
Do. do. in 24 hours, on the 15th,	20 0

Twelve days it rained, and a very large quantity has fallen.

Seven days it thundered and lightned, and there has been a conſiderable quantity.

Coldeſt day the 15th. Warmeſt day the 24th.

METEOROLOGICAL OBSERVATIONS *for September*, 1797.

Days of the Mon.	Thermom. obſerved at Sun-riſe.	at 2 P. M.	Prevailing winds. 6 M.	2 E.	Clear.	Cloudy	Barometer obſerved at Sun-riſe.	2 P. M.
1	73	84	S W	S W	1	1	29 72	29 70
2	76	87	S W	W	2		29 51	29 53
3	63	76	N W	N W	1	1	29 60	29 62
4	63	73	W	N W	2		29 65	29 72
5	61	79	W	S W	2		29 73	29 70
6	58	66	N E	E	2		29 80	29 80
7	58	66	N E	N	2		29 88	29 88
8	57	70	N E	E	2		29 79	29 73
9	58	71	N E	N	1	1	29 82	29 86
10	59	71	N E	N E	2		29 91	29 86
11	52	70	N E	N E	2		29 79	29 75
12	59	73	E	N	2		29 70	29 65
13	60	72	S W	S W		2	29 67	29 65
14	63	80	S W	S	2		29 60	29 59
15	68	71	S W	S W		2	29 54	29 48
16	64	74	N	N	2		29 56	29 56
17	56	70	N E	W	2		29 60	29 59
18	58	64	E	S E	1	1	29 55	29 40
19	57	64	W	N W	2		29 27	29 41
20	51	66	W	W	2		29 70	29 70
21	56	69	S E	S E	1	1	29 70	29 70
22	59	67	N E	E	2		29 70	29 70
23	57	72	N W	E	2		29 64	29 60
24	56	75	W	W	2		29 55	29 45
25	58	74	W	N W	2		29 40	29 50
26	57	69	E	W	1	1	29 60	29 50
27	46	62	N	N W	2		29 80	29 80
28	53	71	N W	N W	2		29 80	29 80
29	58	78	S W	S W	2		29 79	29 81
30	60	65	N E	E		2	29 97	30

Results of Meteorological Observations for September, 1797.

Mean temperature of the Thermometer at ſun-riſe,	deg. 59	2 hund.
Do. do. of the do. at 2 P. M.	71	6
Do. do. for the whole month,	65	4
Greateſt monthly range, between the 2d and 20th,	26	0
Do. do. in 24 hours on the 29th.	20	0

Four days it rained, and a very ſmall quantity has fallen.
Coldeſt day the 20th. Warmeſt day the 2d.

A TABLE *of Patients admitted into the New-York Hospital, from the* 1*st of July to the* 1*st of October*, 1797; *shewing the Disease for which each was received, with the Event of the Case.*

MEDICAL *Patients admitted in July.*

DISEASES.	No.	Cured.	Relieved.	Died.	Remain under Care.	Result.	
Amenorrhœa	1				1		
Ascites	3	2			1 elop.		
Diarrhœa	1	1					
Dysentery	1	1					
Dyspepsia	3	1		1	1		
Gravel	2		1	1			
Hepatitis	1	1					
Intermitting Fever	4	3		1			
Mania	3				3		
Pulmonary Consumption	3		1		1		
Rheumatism	4	2			2		
Syphilis	6	3			3	Received	43
SURGICAL.							
Contusion	3	1			1 & 1e.	Cured	17
Fracture	1				1	Relieved	2
Scrofula	1				1	Died	3
Ulcer of the Leg	5	2			3	Eloped	2
Wounded	1				1	Discharged	1
						Remain	18
							—43

August.	MEDICAL.					
Amenorrhea	1	1				
Anasarca	1				1	
Ascites	3	1		1	1	
Diarrhœa	2	1			1	
Dysentery	3	2		1		
Dyspepsia	1	1				
Gonorrhœa	3	1			2	
Herpes	1	1				
Intermittent Fever	11	9			2	
Mania	4				4	
Pulmonary Consumption	1				1	
Opthalmia	1	1				
Rheumatism	3	1			2	
Syphilis	6	2			3 & 1e.	

SURGICAL.

DISEASES.	No.	Cured.	Reliev.	Died.	Remain under Care.	Result.	
Contusion	4	2			2	Received	66
Fracture	2	1			1		—
Scrofula	1				1	Cured	33
Syphilis	10	5			4&1e.	Died	2
Ulcer of the Leg	7	3			4	Eloped	2
Wounded	1	1				Remain	29
							—66

September. MEDICAL.

Anasarca	1		1				
Ascites	1				1		
Debility	1				1		
Diarrhœa	1	1					
Dysentery	2	2					
Dyspepsia	1	1					
Gonorrhœa	1				1		
Intermittents	12	7			5		
Mania	7	1			6		
Opthalmia	1	1					
Pulmonary Consumption	1				1		
Rheumatism	6	2			4		
Syphilis	3	2			1		
Typhus	5	1		1	3		

SURGICAL.

Diseased Hip-Joint	1				1	Received	60
Fistula Lachrymalis	1				1		—
Scrofula	1				1	Cured	26
Syphilis	6	3			3	Relieved	1
Ulcer of the Leg	5	4			1	Died	1
White Swelling	2				2	Remain	32
Wounded	1	1					—60

SUMMARY.

Patients received into the New-York Hospital from the first of July to the first of October, 1797, exclusive of those then remaining under care, 169

Of this number have been *cured*,	76
relieved,	3
died,	6
eloped	4
was *discharged*,	1
remaining under *care*,	79
	—169

A RETURN *of Patients admitted to the Care of the New-York City Dispensary, from the first of July to the first of October*, 1797.

JULY.

DISEASES.	No.	Cured.	Reliev.	Died.	Removed to the Hospital.	Result.	
Amenorrhœa	1	1				Received	54
Asthma	2	2					—
Hectic Fever	1	1				Cured	50
Erisipelas	1	1				Relieved	3
Syphilis	5	5				Died	1
Dyspepsia	3	3					—
Diarrhœa	14	12	2				54
Jaundice	1	1					
Pneumony	3	3					
Cough	2	1	1				
Pulmonary Consumption	1			1			
Hooping-cough	2	2					
Remittent Fever	3	3					
Fracture	1	1					
Sore Legs	3	3					
Quincy	1	1					
Opthalmia	2	2					
Hæmoptisis	1	1					
Worms	1	1					
Abscess	1	1					
Cholera	3	3					
Herpes	1	1					
Dysentery	1	1					

AUGUST.

Pneumony	4	4				
Intermitting Fever	1	1				
Syphilis	4	3			1	
Typhus	1	1				
Remitting Fever	3	2			1 Elop.	
Cholera	3	3				
Pulmonary Consumption	3	2		1		
Diarrhœa	3	3				
Menorrhagia	1	1				
Constipation	1	1				
Head-ach	1	1				
Sore Legs	3	2	1			
Indigestion	1	1				
Dysentery	7	7				
Calculus	1	1				

AUGUST continued.

DISEASES.	No.	Cured.	Relieved.	Dead.	Removed to the Hospital.	Result.	
Opthalmia	1	1				Received	46
Abscess	1	1					—
Sphacelus	1	1				Cured	41
Hectic Fever	2	1		1		Relieved	1
Epilepsy	1	1				Died	2
Burns	1	1				Hospital	1
Worms	1	1				Eloped	1
Colic	1	1					—46

SEPTEMBER.

Contusion	2	2				Received	32
Anasarca	3	2			1 u. care		—
Indigestion	2	2				Cured	26
Scrophula	1	1				Relieved	5
Dysentery	3	3				Under care	1
Bilious Remittent Fever	3	3					—
Rheumatism	5		5				32
Pneumony	2	2					
Worms	5	5					
Syphilis	1	1					
Opthalmia	1	1					
Intermittent Fever	1	1					
Diarrhœa	2	2					
Bilious Colic	1	1					

SUMMARY.

Whole number of Patients admittted into the New-York City Dispensary from the first of July to the first of October, 1797, 132

Of this number have been *cured*, ...	117
relieved, ...	9
died, ...	4
eloped, ...	1
remains under *care*, ...	1
	132

HUGH M'LEAN.

MEDICAL NEWS.

DOMESTIC.

IN the course of the late and present seasons the Yellow Fever has been epidemic, with considerable mortality, in Bristol and Providence, State of Rhode-Island; in Philadelphia; in Baltimore; and in Norfolk, Virginia. Reports have circulated, but we know not with what foundation, that it was also prevalent in Charleston, South-Carolina. We are happy to have it in our power to communicate certain information, that this disease has wholly ceased its ravages at Bristol and Providence; that there is every appearance of its speedy departure from Philadelphia and Baltimore; and that at Norfolk (where the disease appears to have originated indisputably in local cases) the mortality is at an end. The Remitting Fever has renewed its attacks, but without any signal mortality, in Sheffield, Massachusetts, and New-Milford, Connecticut; and the Dysentery has been very rife in Hanover, New-Hampshire. The following article, from the last-mentioned place, we have reason to believe correct; but more particular information is desirable.—

" Hanover, September 9, 1797. The following is an accurate " statement of the number of inhabitants, and the late mortality, " in the vicinity of Dartmouth College:—

" The whole number of inhabitants, including members " of College, amounts to about	520
" Number of people affected with the Dysentery, about	203
" Died of Dysentery, only	5
" Of Dysentery and Whooping-Cough,	7
" Of Consumption and Dysentery,	4
" Without Dysentery,	4
" Whole number of deaths,	20

" Of these five were adults, the other fifteen were children. The " ravages made by the late sickness are the more remarkable, as " the place, generally, heretofore, has been esteemed one of the " most healthy places in the world. This is the first instance of " the prevalence of an epidemic."

A remarkable disease occurred, during the last spring, among the CATS in London, which extended itself over several other parts of England. In three parishes in London, upwards of 5000 cats are computed to have been destroyed by it, within a fortnight. The most common period of the disorder is said to have been six or seven days; and a puking of greenish bile, and delirium, are enumerated among the symptoms, of which we have seen no account sufficiently accurate to be relied on. The following paragraph is extracted from the "Account of Diseases in London, from the 20th of March to the 20th of April, 1797"—published in the Monthly Magazine for April last.

"After the abatement of the Epidemic Catarrh, a violent dis-
"ease fell upon the Cats, by which many hundreds of those do-
"mestic animals perished. The particular symptoms of their
"malady I had not a sufficient opportunity of ascertaining: but
"from dissections, it appears, that the bowels had been drawn to-
"gether by a violent cramp, or spasmodic constriction, involving
"likewise the omentum, and preventing any passage. In some
"the intestines were partially red, or blackish; but in the greater
"number of instances, the contraction and extraordinary twisting
"of the bowels had taken place without any marks of inflamma-
"tion."

This is probably the same disease which has appeared, among the same animals, in various parts of the United States, the present summer and autumn. Hitherto, though we have taken some pains to this end, we have been unable to trace the exact progress, or determine the precise symptoms of the disease. In the hope of obtaining communications from our correspondents and others, we have collected together such information as has already been made public, and as has fallen under our more immediate observation.

The *cat-distemper* made its appearance in Philadelphia in the latter end of May or beginning of June last; and is supposed to have destroyed not less than four or five thousand cats.

In August it was observed among the cats in New-York.—In general, the animal appeared moping and melancholy, without appetite, thirsty, restless, and inclined to solitude. Numbers died, after a gradual decline, in this manner. Scarcely one was to be seen but that looked thin and weak. In other instances the animals were seized with puking and delirium; and when delirious, flew about the houses or rooms they were in, but without attempting to injure any person. Some were seized with delirium and puking only at the last of the disease. Some were observed to have an uncommon flow of saliva. We know not that it was observed whether such recovered.

During the continuance of this epidemic in New-York, a num-

ber of these animals left the city, and took refuge in the adjoining country houses. Three arrived, in one day, at the house of a gentleman who resides near Corlaer's Hook, about two miles from town.

The number that died we have not accurately learned; no estimation makes it less than three or four thousand.

In two instances, *lap-dogs*, that were wont to play with the *cats*, in the houses to which they belonged, were affected with a similar complaint. One was killed, near to death: we are uninformed of the fate of the other.

The next public intimation of the appearance of the *cat-distemper* was from Portsmouth, New-Hampshire, (if we recollect rightly) towards the end of August.

Early in September its arrival in Boston was announced in the papers of that town.

The last account we hear of it is from Albany, in the beginning of October.

None of the editors of the public papers, in either of these places, as far as we can discover, have given any further information concerning this disease, than merely to notice its existence, and the mortality occasioned by it.

In a Meteorological Journal, accompanied by remarks on the diseases of the season, and their treatment, which has been kindly transmitted to us by that curious and careful observer, Dr. Shadrack Ricketson, of Dutchess County, we find the following remarks, towards the close of his observations on the three spring months. "It may not be wholly foreign or improper to remark, "that *horses* were very generally and severely afflicted this spring "(1797) with the common distemper in the glands of the head "and throat; for, it has frequently been observed, that horses "and dogs have been affected as concomitant, or presaging, epi- "demic or pestilential diseases: but whether the present, or some "future sickness is to follow, I leave for future observation to "determine."—In concluding his remarks on the weather and diseases of the last summer, Dr. Ricketson says, "In my last I "mentioned that horses were severely afflicted with their common "disorder, which has continued to be the case, but not so gene- "rally; and, I may now add, that *dogs* have been, in like manner, "violently disordered with a cough, &c. most of the summer."

Information has been conveyed to us, from a part of Connecticut, of some distemper among *neat cattle;* but the imperfect statement of facts which we have received, and the expectation of more minute accounts, induce us to do nothing more at present than to mention the fact.

A Richmond (Virginia) paper, of the date of August 16, 1797, has the following paragraph. "For upwards of a week past, the "inhabitants of this place have been astonished with the appear- "ance of vast quantities of dead *fishes*, which have been continually "floating down James' River." Various unsatisfactory conjectures are offered as to the cause of this singular mortality.

We are informed that a remarkable mortality, we know not from what cause, happened in the summer of 1795, among the Fish in Saratoga Lake, in this State, (at which time it was noticed that the water in the lake had a remarkable greenish appearance, with a thick skim on its surface): and a like pestilential disease is said to have destroyed great numbers, some years ago, in a pond near, or in, the town of Brookfield, State of Massachusetts.

As connected with these facts, we insert an extract of a letter from Mr. George Harries, to Dr. Mitchill (then at Edinburgh) dated Haverford-west, Pembrokeshire, South-Wales, July 22d, 1786.

"As Edinburgh must now be very thin, and those who remain, "most likely are engaged in little societies for the improvement "and entertainment of themselves, during this idle time of the "year, every *true* fact will probably be acceptable.—That which "I am going to mention relates to the poisonous effects of tobac- "co, and may be relied on as an undoubted one.—An American "ship, belonging, I think, to the Tracey's, of Boston, was un- "fortunately lost, through the ignorance of the pilot, on our "rocks. Her cargo consisted of tobacco, which floated in large "quantities on the surface of the water, and impregnated it with "its flavour to a considerable extent. It proved a deadly poison "to great numbers of *fish;* many of which were taken up and "thrown upon the shore in the neighbourhood of the wreck: it "is not material what fish:—lobsters and flat-fish were among the "number."

Bennington, (Vermont) August 3, 1797. A quantity of purging salts, manufactured from a spring in *Orwell*, in this State, has been exhibited to the District Medical Society, which are found to be equal, if not superior, to any of the imported salts: they are less nauseous, and are milder in their operation.

The following article, which appeared in a Boston paper last August, has excited much unsatisfactory observation and inquiry.

"On the 16th inst. Mr. Merrick, who resides at Little-Cam- "bridge, discovered a comet, covering the star placed at the in- "sertion of the tail in the body of the Little Bear. It was be- "tween 8 and 9 o'clock in the evening; and at the same hour on "the 17th inst. he saw it advancing towards the star *(mu)* in the

" Dragon, of which it had crossed the body; having moved at a " rate through the heavens twice as rapid as the moon. On the " 18th and 19th inst. it will be nearly on a line with what may be " called the pointers of the Little Bear; and about eight or nine " in the evenings of those days, if the weather be clear, it will be " seen to the west of our zenith, and not very far distant from " it. This comet at present has no tail, but appears as a small ne- " bulous or cloudy star, of a round form, being most bright to- " wards its centre or nucleus."

Since the publication of the above paragraph, the comet has been mentioned in the public papers, from different parts of the continent, as having been seen in the most opposite situations, and at irreconcilable hours in the evening. We, ourselves, have had opportunity to observe, that both the planet *Venus* and the planet *Jupiter* have been mistaken for the comet. And as the planet Mercury was in its greatest elongation on or about the 19th of September, (when the reports concerning the comet were most prevalent) it is not impossible that some of the observers may have had a glimpse of this star, a little after sun-set, and have mistaken it also for a comet.—As no new observations have been published by the gentleman who is represented as having originally made the discovery, the public have lately doubted the reality of any such appearance. It would be doing a real service to science (if the whole of what has been said about the comet be not a mistake) to publish such correct information that there may be no future misapprehensions on the subject, and that, if it be not too late, observations may be multiplied concerning it, in various parts of the United States.

The Chemical Museum of Columbia College, New-York, has been lately enriched by an extensive collection of MINERALS, the donation of Mr. Samuel Owens, a gentleman from Belfast (Ireland,) who has become a citizen of this state.

There is in the city of New-York, at this time, an instance of a singular monster. A calf, about seven or eight months old, is now exhibited as a shew, whose *heart* is apparently in its neck or throat, a little forward of the brisket. Its pulsations can be seen at a considerable distance, and its motions, like those of the auricles and ventricles, very plainly felt. The best judges in the city, who have examined this remarkable creature, are of opinion, unanimously, that this lump, or tumor, is not an *aneurism*, *wen*, nor any thing of those kinds, but truly the *heart*. The calf appears somewhat lean, but lively, and in good health. So singular a *lusus naturæ* is worthy of being particularly noticed; and we hope

that an opportunity will one day offer of ascertaining all the facts relative to this oddly-placed heart, by dissection.

The question, "Is the Yellow Fever always an imported dis-"ease in these States, or may it be generated in them by local "causes?" has lately excited much public and medical attention and discussion.—Dr. David Hosack, the Professor of Botany and Materia Medica in Columbia College, has lately given notice to the public, that, after having collected the material evidence on this subject, he has given over the papers to his pupil, Mr. John De Normandie Gillespie, who has chosen this question as the theme of an Inaugural Essay, which is shortly to be published. In this Essay, we understand, it is the expectation of the author to establish the opinion, that the Yellow Fever is always an *imported disease*.

Dr. Currie, of Philadelphia, is publishing a series of letters, in support of the same doctrine, addressed to Mr. Benjamin Wynkoop, in the public papers of that city; and Mr. Webster, of this place, replies to Dr. Currie, also in a series of letters, published in the Commercial Advertiser, a paper conducted by the last-named gentleman.

We learn that Professor Barton, of Philadelphia, who has lately made a tour through the western parts of the States of New-York and Pennsylvania, intends to favour the public with a Journal of his excursion. This is the more desirable, as we understand that a number of new things have occurred to him in mineralogy and botany, zoology, &c.

FOREIGN.

The following Extract of a Letter from John Marsillac, (a Member of the Society) is translated from the Journal of the Philomathic Society, &c. (Bulletin de la Société Philomatique, &c.) for October and November, 1792. *The Facts appear to have occurred in England; but we have not observed any mention of them in the English periodical Publications.*

"A peasant of the county of Essex, seeing a great many chil-"dren carried off by the *natural* small-pox, was desirous of inocu-"lating his two boys; one nine, and the other twelve years old. "Not being able to employ a surgeon, he collected the scabs of a "child then sick of the disease, powdered them, and sprinkled the "powder upon slices of bread and butter. The two sons ate them,

" and gave a bit to the *house-dog*. They had a mild small-pox, and " got well without any remarkable accident. The dog remained " sick for two or three days, drinking a great deal, and refusing " to eat; on the fourth, he had a very decided variolous eruption; " on the ninth the pustules were full ripe, and dried up and fell " off, like those of the two children. An English author says he " has observed the same epidemic in a flock of *sheep*, the greater " part of which were affected, and communicated it to two *cows*, " one of which died. The symptoms that manifested themselves " in these animals, in the course of the disease, were in every re- " spect the same as are observed in the human species."

A paper, as we are informed, has been read at one of the late meetings of the Royal Society of London, containing a course of experiments on the combustion of the DIAMOND. It has long been known that this was not an *earthy*, but an *inflammable* substance. But it was not known until now, that this *precious gem* could be converted, by aid of oxygenous air, into carbonic acid gas. This, however, is found to be the fact; and scientific men are led to conclude this brilliant and rare substance to be neither more nor less than *chrystallized charcoal*.

Extract of a Letter from Dr. Beddoes to Dr. Mitchill, dated Clifton, June 15, 1797.

" We seem to have discovered a sure remedy for *diabetes*. It " has answered in three cases of *diabetes mellitus*. Abstinence " from vegetables, and a few drops of *hepatized ammonia*, reduced " the quantity of urine, in two cases, with great rapidity. In one, " volatile alkali only, without absolute abstinence from vegetables, " answered; but the Hot-Well water *(Bristol)* was taken in this " case, and could not be avoided on account of the prejudice of the " patient.

" But I think you will find abstinence from vegetables, with " volatile alkali, either unimpregnated or impregnated with hepa- " tic gas, subdue the most obstinate cases.

" Dr. Rollo, of Woolwich Hospital, is going to publish on " this subject. To him the application of hepatized ammonia " is due.

" I have between 2 and £ 3000* for my Pneumatic Hospital, " which I shall establish forthwith. The observations yet made, " in this country, are partly too few, and partly too inaccurate."

Dr. Rollo's work, we observe by the late London papers, has since been published, in two vols. 8vo; and we hope shortly to have the satisfaction of laying before our readers a more detailed account of his discoveries.

* Sterling.

To the publication of Dr. Rollo, noticed above, is annexed an account of experiments by Mr. William Cruikshank, on the efficacy of *nitrous acid* in the cure of *syphilis*, agreeable to Mr. Scott's method, (See Med. Repos. No. 1. Append.) which we understand are very favourable to that remedy. Indeed, trials seem to be multiplying in various parts of Great-Britain. Dr. Beddoes is now printing, or has already published, a collection of "Reports of the "Effects of the Nitrous Acid in the Venereal Disease." In a letter to Dr. Mitchill, dated Aug. 22, 1797, inclosing the first sheets of the (then) unpublished work, he says, "I send you, by Mr. Garnet, "a proof of the vigour with which the experiments on the anti-"syphilitic powers of the septous acid have been prosecuted in this "country. It appears, even in respect to its certainty, a medicine "superior to any mercurial. Nevertheless, I have collected the "account of some failures, without being able to say on what "the difference of the result depends: a case so common in medi-"cine."

That portion of Dr. Beddoes' reports which has been received, consists of twelve cases, in which the acid effected a cure in the Royal Hospital at Plymouth, reported by Mr. Hammick, jun. a surgeon in that establishment. These are followed by a letter from Dr. Beddoes to Dr. Geach, senior surgeon of the Royal Hospital at Plymouth, whose answer corroborates Mr. Hammick's statements. Some further information is given on the subject, in another letter from Mr. Hammick. The remainder consists of five cases reported by Mr. Sandford, surgeon at Worcester. We confine ourselves, at present, to presenting a copy of Mr. Hammick's letter to Dr. Beddoes, which commences the collection. Should a more leisurely examination convince us that further extracts will interest our readers, and the subject not have grown too common, we shall insert some of the most valuable papers in our succeding numbers. The letter is as follows.—

"*Royal Hospital, Plymouth, July* 22, 1797.

"Sir,

"I do myself the honour of acquainting you that, in consequence of your very ingenious publication on factitious airs (Parts IV. and V.) and your recommendation of the nitric acid in syphilis,* I have been induced to make trial of the medicine in that disorder, under the inspection of my friend, Dr. Geach, who is the senior surgeon of this hospital; and to him I beg leave to refer for the confirmation of the faithful statement of several cases, and the authenticity of the facts.

* For the papers here referred to, see the Appendix to the present Number of the Medical Repository.

"Further—Dr. Geach has been so obliging, as to say he will answer, as far as he can, any questions relative to this subject.

"As I am one of the assistant surgeons under him, and many of the venereal wards are in our department, I had an opportunity of selecting the *worst* venereal cases that were brought into the Royal Hospital. The cases in which the nitric acid has been given already amount to more than fifty in number; and the success has fully answered the character which has been given this newly discovered remedy, which effects a cure, for the most part, in a short time, without impairing the appetite, without requiring any precise or particular regimen, or strict confinement, leaving none of those ill-consequences, or depredations, that often follow the liberal use of mercury.

"The nitric acid does not affect the gums, fauces, or intestines, by exciting vomiting, diarrhœa, or pain, unless the medicine be swallowed hastily, and in large draughts at a time; when thus taken I have known that it has produced a nausea, or mawkish, disagreeable sensation in the stomach, and set the teeth on edge by its acidity; all which inconveniencies have been prevented by enjoining the patient to drink the medicine through a narrow glass tube.

"Not to multiply instances, and tire you with a long detail, I beg leave to submit to your inspection and consideration twelve cases, with a request that you will be pleased to publish them, as they corroborate your own observation: and the publication under your authority may extend the use of the nitric acid, in a disease so varying, that few constitutions can withstand the power of two poisons, the disease and the mercury, operating at the same time. Future experience, however, must determine, whether the cures wrought by the nitric acid will be permanent or not; but if it be permitted to draw conclusions from the progress of the several ulcers, the healthy appearance, and the firmness of the granulations, the softness of the parts, and the cicatrices, little doubt can be entertained but that the nitric acid will, in a great measure, supercede the use of mercury in the venereal disease; and, as yet, I have seen no instances of the disorder re-appearing after the use of this medicine.

"I have the honour to be,
"Sir, &c. &c.
"STEPHEN HAMMICK, jun."

Dr. Carmichael Smyth's mode of preventing or stopping contagious diseases on ship-board, by nitrous fumigation, is now generally adopted throughout the British navy. This discovery has been also taken up lately by the Court of Spain, which has ordered the translation of the doctor's treatise into the Spanish language,

and directed a similar process to be observed in the Spanish marine. [*Monthly Magazine.*

A correspondent of the Norfolk Chronicle recommends as a means to restore infectious air to purity, to wet a cloth of any kind in water mixed with *quick-lime*, and to hang the cloth so steeped in a room till it become dry; after which to renew the operation as long as appears needful. [*Ibid.*

Mr. Nicholson, well known by his "Introduction to Natural "Philosophy," "First Principles of Chemistry," &c. has commenced the publication of a periodical work, entitled "A Journal "of Natural Philosophy, Chemistry, and the Arts: illustrated with "Engravings." It is published monthly, and in 4to. We have received the two first numbers, for April and May last, which contain about 50 pages each, and give reason to expect that the undertaking will be ably and spiritedly conducted. The Journal consists of original and selected essays.

Professor Reich, of the University of Erlangen, in Germany, writes, that several of Dr. Mitchill's pieces on pestilential fluids have been translated into German, and published in the Literary Journals of that country. In pursuance of Dr. Mitchill's original idea, this principle has been applied to explain the distempers of domestic animals, particularly a very violent disease which raged among the cattle in Germany last year. Two tracts have been published on this subject, Reich's Belehrung fur den landman uber die Rindvielseuche (Information for Farmers, concerning the very pestilential Distemper among Cattle,) and Albert's Dissertation de luis Bovillæ origine et Natura, which we hope soon to receive.

From the similarity of constitution between man and quadrupeds, it might be supposed a priori, that pestilential fluids would have very much the same operation on both; and this idea receives strong confirmation from the distempers among cats, dogs, horses, and neat cattle, of which we have received information from different parts of the country. It is much to be wished, that correct statements of facts, relative to the disorders of these and all domestic animals, could be procured, especially when they occur as in the present year, both before and during the breaking out of pestilential diseases among mankind. We hope our friends in the country will engage in this investigation, that we may be enabled to judge how far these cotemporaneous events are deducible from the same principle or referable to the same cause.

MEDICAL OBITUARY.

DIED. At Portsmouth, (N. H.) lately, Dr. Hall Jackson, an eminent physician of that place. His death was occasioned by his being thrown out of his chaise.

At Providence, (R. I.) Dr. Ephraim Cumstock, of the Yellow Fever.

At Jamaica, (L. I.) Dr. William M. Johnson, a native of Massachusetts, but lately from South-Carolina, where he had settled as a practitioner of medicine. He died Sept. 21, 1797, of a complication of disorders, originating in a fever contracted in Carolina.

At Philadelphia, of the Yellow Fever, Dr. Nicholas Way, Sept. 2.—Dr. Jacob Thompson, August 29.—Dr. Samuel Jones.—Dr. Annan, Oct. 4.—Dr. Dobel,—and Dr. Samuel Pleasants, Oct. 15, 1797.

At Baltimore, Dr. Edward Johnson.

At Charleston, (S. C.) Dr. Prentiss, originally from Massachusetts.

FOREIGN. In Swisserland, within the present year, the celebrated Dr. TISSOT, universally known by his professional writings. Dr. Tissot survived his friend ZIMMERMAN (whose death was noticed in the first number of the Repository,) long enough to publish a history of his life, which has since been translated into English.

APPENDIX.

DOMESTIC.

Concerning the Use of Alkaline Remedies in Fevers, and the Analogy between Septic Acid *and other Poisons; in a Letter to* THOMAS PERCIVAL, M. D. *&c. of Manchester, from Dr.* MITCHILL, *dated New-York, January* 17, 1797.

ONE of my friends, who lately returned from Philadelphia, informed me, that some time ago Dr. PRIESTLEY had forwarded to me a copy of his "Considerations on the Doctrine of "Phlogiston." I have to regret, that the pamphlet never reached me. Had it regularly come to hand, I should not have omitted to acknowledge the favour long before now. I have, however, procured a copy since, and perused it with care. It pleases me to find him strenuously urging the supporters of the antiphlogistic doctrine, to prove rigidly, by experiment, every thing they assert; to repeat doubtful experiments again and again, and to reconcile to their system a number of facts which appear to stand in formidable opposition to it. All that he states relative to the constitution of *metals*, to the composition and decomposition of *water*, and concerning *finery cinder*, requires unquestionably further inquiry and consideration. In particular, what he affirms about the formation of *highly phlogisticated nitrous acid*, by taking an electric spark through a *mixture of dephlogisticated and inflammable airs*, is so materially different from what almost the whole philosophical world has of late allowed, that the establishment of it will give a new aspect to things, and overturn much of their reasoning. Messieurs BERTHOLLET, DE LA PLACE, MONGE, MORVEAU, FOURCROY, and HASSENFRATZ, have now a fair opportunity of solving those difficulties, and convincing him of their reconcilement with the New System. For myself, I am one of those who, like BLACK and KIRWAN, changed the phlogistic hypothesis for the antiphlogistic theory, and thought myself a gainer by the bargain.

The inquiry, in which I am engaged, concerning the generation of pestilential fluids, and their action upon the bodies of animals, has led me to examine, to a certain extent, the composition of saline remedies, and their probable mode of operation in the dis-

tempers called "FEBRILE;" and to trace the connection and analogy between "fevers," and other disorders caused by *venomous* fluids. If, by adopting the French nomenclature, and by building upon facts, which have been said to be firmly established, I have been led into any mistakes, either of language or science, they will, I trust, be found to interfere with some part of my *particular reasoning* only, but not to militate at all against my *general conclusion.*

If it is true, that the fluids which, combining with pot-ash, form salt-petre, and with lime, calcarious nitre, are not of mineral origin, but are commonly produced from animal substances, or vegetables that resemble them; if they are not of the putrid kind, but, on the contrary, are highly antiseptic in their operation; and if, at the same time, those antiseptics can speedily destroy life by inducing the worst of symptoms, then they ought, in strictness, not only to be considered as *poisons*, but as *animal* or *vegetable poisons.* And all the *fevers*, as they are termed, of the *malignant*, *putrid*, and *pestilential* forms, are, of course, neither more nor less than the effects of these poisons upon the bodies of animals. Whoever, therefore, falls sick of a plague, or a yellow fever, or any other disease of the same group, should, in proper language, be spoken of as *poisoned*, and treated accordingly.

To him who has perused the preceding papers which I have published on this subject, it will probably appear, that the form which this animal poison takes on, in ordinary cases, is that of an oxyd or acid of septon. Though it becomes me here to observe, that I like not the common way of distinguishing these things into animal and vegetable, because such an arrangement has very little precision and correctness in it, and because the analysis of much vegetable matter shows it to be so similar in its composition to that of animal, that, whatever obvious and superficial differences may appear between the one class of bodies and the other, there can hardly be a distinction in science between the two. And the reason of my dislike will farther appear from what I shall hereafter observe to you.

To a large class of the effects of these poisonous fluids, the term "fever" has been applied. And as such fevers have constituted a great part of human maladies from the beginning, it might be expected that, by this time, their causes would have been thoroughly investigated, and their treatment exactly understood; but this is far from being the case. The misapplication of names has obscured this department of knowledge with clouds and darkness. The discordant opinions of physiologists and physicians, two of whom can scarcely be found to agree, shew, that the rays of science have hardly begun to illuminate or organize this mass of rudeness, after the experience of two thousand years. I question much, whether those venomous or pestilential complaints are better understood, or more successfully treated, than in the days of *the sage of Cos.*

On examining the history of medical practice in "fevers," that is, in cases where those poisonous substances stir up more or less of commotion in the heart and blood vessels, the stomach and bowels, &c. &c. it appears there is no point in which prescribers so much agree as in the administration of alkaline remedies. While contention and strife divide practisers at consultations, whether the alexipharmic, or the depleting plan shall be adopted, they seldom differ much about the administration of soluble tartar, a saline mixture, or some of Mindererus's spirit.

As these remedies enter very deeply into the practice of almost all parties, and have long maintained their reputation, it is very interesting to philosophy and science, as well as to the art of physic, to detect the reason why almost every body agrees in the use of them, in some form or other. By *alkaline remedies*, I mean not merely the pure or caustic alkalies, but all such compounds of other bodies, with alkaline bases, as are capable of being decomposed by the septic poison or acid they may meet with in the human body, and of furnishing an alkali to unite in such cases with these sour and venomous fluids, and thereby to saturate them.

From the class of such substances as yield their alkalies to septic acid, are taken many of the most frequent and popular remedies for "fevers;" and that the whole of them may be exhibited to view at once, their composition understood, their names rectified, and their manner of operating be explained, I have thought it proper to enumerate the greater part of them in the following catalogue: I shall exhibit them under two divisions, of salts and earths; *and first, of alkaline salts.*

I. POT-ASH.

1st. By itself.

Common and old Names.	*Scientific Names.*
Common Caustic, weak and strong, Potential Cautery, Sharp Salt of Tartar, Nitrum Fixatum,	Pure or Caustic Pot-ash.

2d. With Water.

Oleum Tartari per Deliquium, or Ley of Tartar, Lixivium Saponaceum, or Soap Ley,	Solution of Caustic Pot-ash in Water.

3d. With fixed Air, or Carbonic Acid.

Mild Salt of Tartar, Salt of Wormwood, Common vegetable fixed Alkali, &c.	Carbonate of Pot-ash.

4th. With Acetous Acid, or Vinegar.

Regenerated Tartar,
Terra Foliata Tartari,
Sal Diureticus,
} Acetate of Pot-ash.

5th. With Acid of Sulphur, or Vitriolic Acid.

Vitriolated Tartar,
Universal Digestive Salt,
Sal Enixus Paracelsi,
} Sulphate of Pot-ash.

Some particulars concerning the partial decomposition of vitriolated Tartar, by nitrous acid, may be seen in BERGMAN's Dissertation (§ 9), where it is declared, that after adding powdered vitriolated Tartar to diluted nitrous acid, spirit of wine precipitated a powder from the liquor, which proved to be *real nitre*.

6th. With Citric Acid.

Effervescing Mixture, with Juice of Lemons, &c.
Common Saline Mixture, &c.
} Citrate of Pot-ash.

7th. With Sulphur.

Hepar Sulphuris—Liver of Sulphur } Sulphure of Pot-ash.
Sal Prunellæ } Sulphureo-Septite of Pot-ash.
Sal Polychrest,
Salt of many Virtues,
} Pretty much the same with Sal Prunellæ, though approaching nearer to Pot-ash.

8th. With Oil, Fat, Tallow, and Resin.

Sapo Tartareus,
Soap of Tartar,
Turpentine Soap,
} Terebinthinate of Pot-ash.

Sapo Amygdalinus,
Almond Soap,
Sapo ex Oleo Olivarum,
Castile, Venice, or Alicant Soap,
Sapo Communis,
Tallow, or Slush Soap,
Black Soap.
} Oleates of Pot-ash.

9th. With Acid of Tartar.

Common Tartar,
Tartarum,
} Acidulated Tartrite of Pot-ash, mingled with Carbone and other foreign matter.

Cream of Tartar,
Cremor Tartari,
} Acidulated Tartrite of Pot-ash, dissolved in water, boiled and skimmed.

Crystals of Tartar,
Crystalli Tartari,
} Cream of Tartar re-dissolved and chrystalized.

Tartarus Tartarizatus,
Soluble Tartar,
} Neutralized Tartarite of Pot-ash.

10th. With Muriatic Acid.

Sal Febrifugus Sylvii } Muriate of Pot-ash.

II. SODA.

1st. By itself.

Nitre of the Ancients,
Natron,
Natural Fossil Alkali,
Marine Alkali,
} Pure, or Caustic Soda.

2d. With Water.

Lixivium Natri—Solution of Caustic Soda in Water.

3d. With Carbonic Acid.

Mild Natron—Soda,
Salt of Barilla,
} Carbonate of Soda.

4th. With Ashes, &c.

Kelp————Impure Soda.

5th. With Phosphoric Acid.

Phosphorated Mineral Alkali,
Soda Phosphorata,
} Phosphate of Soda.

6th. With Muriatic Acid.

Common Salt,
Sea Salt,
Culinary Salt,
} Muriate of Soda.

7th. With Boracic Acid.

Borax————Borate of Soda.

8th. With Oils, Fats, &c.

Various Soaps, &c.————Oleates, &c. of Soda.

9th. With Tartaric Acid.

Rochelle Salt,
Sal Rupellensis,
Soda Tartarisata,
} Tartrite of Soda.

III. AMMONIAC.

1st. By itself.

Caustic Ammoniac,
Volatile Ammoniacal Salt,
} Pure or solid caustic Ammoniac.

2d. With Water.

Spirit of Sal Ammoniac, with Quick Lime,
Eau De Luce,
Aqua Ammoniæ Pura.
} Fluid Caustic Ammoniac.

3d. With Carbonic Acid.

Mild or aërated Volatile Alkali,
Spirit of Hartshorn, &c. &c.
Aqua Volatilis Cornu Cervi.
} Carbonate of Ammoniac.

4th. With Acetous Acid.

Aqua Ammoniæ Acetata, Spirit of Mindererus, } Acetate of Ammoniac.

5th. With Muriatic Acid.

Common Ammoniacal Salt, } Muriate of Ammoniac.

In this long list of alkaline substances, which enter so largely into medical prescriptions in febrile diseases, I have intentionally omitted the combinations of pot-ash, soda, and ammoniac, with the septous and septic acids; and I have taken no notice of emetic tartar, cuprum ammoniacum, and some other alkaline preparations, where the virtue of the remedy resided less in the small quantity of alkali than in the antimony, copper, or other substance with which the alkali was united. And Glauber's salt is omitted, because the septic acid cannot decompound it. What I wish particularly to observe is this, that all the articles of the Materia Medica herein enumerated, are either pure alkalies, or are combinations with other substances, for which the alkalies have a weaker attraction than for septic acid, and are consequently ready to join the septic acid wherever they meet with it, and to saturate it.

Secondly. Of Alkaline Earths.

I. LIME.

1st. By itself.

Quick Lime, } Pure or Caustic Lime.

2d. With Water.

Lime Water, } Solution of Quick Lime in Water.

3d. With Carbonic Acid.

Chalk,—Creta Preparata, Crab's Eyes, Prepared Coral, Calcined Oyster Shells, &c. } Carbonate of Lime.

II. MAGNESIA.

1st. By itself.

Calcined Magnesia, } Pure Magnesia.

2d. With Carbonic Acid.

Common or Effervescing Magnesia, } Carbonate of Magnesia.

These absorbent earths will also combine with septic acid in all circumstances favourable to their union, and constitute septites of lime (calcarious nitre), and of magnesia, (nitrous magnesia.)

If any of these substances, whether salts or earths, are prescribed, and, on being swallowed, do meet with septic acid in the stomach or intestines, the necessary consequence is, that their basis will quit the weaker, and join the stronger acid. The prescription

of these things then is, in fact, under such circumstances, the prescription of alkalies. Few of the prescribers, I believe, calculate how many alkaline remedies they order for their patients, and fewer still have any tolerable idea of their real manner of operating. It is amusing enough, that they, who, in their *conversation*, doubt or deny the truth of the conclusions I have made concerning these sorts of distempers, are all the time in the habit of verifying them *in their practice*, and bearing witness for them daily by their prescriptions.

Some of the skilful and knowing ones tell me gravely, I am prescribing for a *phantom*, for a creature of my own imagination, and that nothing can be more remote from common sense, or even probability, than that a man should distil salt-petre in his belly, and carry about the aqua-fortis in his intestines. Whence comes the nitre in the alimentary canal? Where is the stronger acid to decompose it? Who, in his right mind, could ever think of comparing the human stomach to a retort? The answer to all these pretty questions is very short:—That without a distilling process, or a retort, or nitre, or a stronger acid, the stomach and intestines may acquire their septic liquids from the same sources whence pot-ash gets them to form common salt-petre; that is, from the putrid substances, whether animal or vegetable, which, in the first instance, evolve them.

All that is now necessary to show is, that such putrid substances do occasionally exist in the alimentary canal, and that the septic fluids are generated by them. According to my judgment, there can be little doubt of the production of septic acid in the human mouth, from corrupting remnants of food, of its operation in incrusting and corroding the teeth, vitiating the taste, mingling with the saliva, nauseating the stomach, &c. (Letter to Professor HOPE, of Edinburgh.) And that the articles of human food may afford it, appears further from other experiments. For instance; there can be no doubt of its production from putrid blood, whose vapours, in CHAPTAL's experiment, were capable of converting chalk to calcarious nitre. (Elements, &c. article SODA.) And, by trials not more liable to objection, did THOUVENEL prove the existence of septic acid, in the exhalations from *other* putrifying animal substances.

The blood and muscular parts of animals, thus, by putrifying in open air, afford septic vapours, which, when condensed and collected, turn out to be septic acid.

Now, as man is a carnivorous animal, and both blood and muscular solids are frequently taken into his stomach, wherefore comes it to pass, that septic acid is not always produced from a mass of dead animal matter exposed to heat, moisture, and air, as the contents of the stomach are? They who are acquainted with

the functions of that organ know, that in its healthy state, the putrefactive tendency is checked by the gastric fluid, which dissolves the soluble part of the food, and makes it assume a form exceedingly different from putridity. It hence follows, that as long as the stomach prepares good concoctive juice, in sufficient quantity, so long will the contents of it be prevented from undergoing that process whereby septic acid is formed.

But when, from intemperate drinking of hot spirits, or of cold water, from excessive exercise, or too great heat, or from any other cause, the healthy functions of the stomach are imperfectly performed or intirely cease; then food, of the above-mentioned kinds, will corrupt for want of a sufficiency of good gastric fluid to dissolve or concoct it; and the production of septic fluids will, of course, be the unavoidable consequence.

As long, therefore, as a man can keep up his digestive powers, so long will he be free from the internal causes of intestinal "fevers," be his food and diet what they may. Whilst the menstruum which the stomach prepares, is sufficient, in quantity and quality, to perform its proper work, so long will indigestion and its putrescent consequences be guarded against. There would seem, therefore, to be two unpleasant consequences resulting from a weakened stomach; *to wit*, 1st. the corruption of certain articles of diet, within that hollow viscus; and, 2dly, their immoderate retention in a part of the alimentary tube, possessed of exquisite sensibility, and intimately associated with every part of the body. By corruption and detention, the food and morbid humours form frequently as foul and pestilential a collection as any puddle the street contains. Is it wonderful, that flatulency, anorexia, nausea, black vomiting, gastritis, &c. are the frequent consequences?

Is it not wonderful, considering the manner in which *Americans* live, that internal distempers from this cause are not more frequent and deadly?

This indeed would happen, had there not been a secretory bowel in the body of a large size, and important office; I mean the liver, which prepares a considerable quantity of an alkaline liquor, the bile, capable of saturating any small excess of acidity that may prevail in the chyle, by its seasonable and wholesome admixture. The gall-bladder is remarkably and conveniently provided with a residuary portion of this health-preserving fluid, which corrects, as far as it can, any sourness in the alimentary mass, after it has undergone the solvent operation of the gastric juice.

Truly, this secretion of the liver, which some physiologists have treated as an excrement, and others considered as the cause of a vast amount of "febrile" mischief, appears to be one of nature's grand preventives, or antidotes, of the very evils it has been accused of producing.

Mistaken notions have too long prevailed, to the shame of physic, concerning the use and operation of the gall. Its alkaline qualities show how well it is calculated to quell a redundant acid in the first passages. The yellowness of the skin, in certain pestilential diseases, can be better accounted for from the influence of septic acid striking such a colour as it acts upon the skin than from the presence of the bile; and the considerable quantity of it secreted in some of the cases of poisoning called fever, shows not that it is the cause of the disease, but that a copious flow of it has prevented, in the intestines, the fatal consequences of much SEPTIC VENOM produced there. The greenness of the bile, in such cases, is a proof of its mixture with an acid: and, if further evidence is wanted of its salutary and preserving power, I pray you to examine the dissections of bodies dead of YELLOW FEVERS, &c. and satisfy yourself, that as far above and below the orifice of the ductus communis choledochus, as the biliary fluid extends, so far the duodenum and continuous parts of intestine are free from inflammation and its consequences. As to the *artificial* discharges of bile, provoked by frequent and injudicious emetics and cathartics, I need only to refer you to RICHTER's Observations, (chap. xvii.) where this secreted humour is rescued from much of the blame and obloquy that had, for years, been uttered against it.

There would be great ease in bringing to your recollection the sour belchings and vomitings, and a variety of other inconveniencies, besetting the parts between the lips and the pylorus; and it would be just as easy to enumerate the dysenteric symptoms excited by the same morbid cause in the large intestines, between the lower part of the jejunum and the extremity of the rectum, from rotten and feculent matter lodged there, after the strength of the bile was exhausted. But I fear the enumeration of all these symptoms in detail would be tedious, since, if the presence of septic acid in the stomach and colon is admitted, its inflammatory, corrosive, excoriating, and dangerous effects, will, at once, be suggested to your mind. And does not the accompanyment of dysentery with *fevers*, both of the intermittent and remittent types, and their alternations with each other, throw great light upon the whole of these morbid phenomena, and prove them all to depend upon the same common cause?

But here I know it will be objected to me, that my reasoning is all wrong. The old story of the *alkaline products* of putrefaction will be told over, and acids and other "antiseptics," as they are called, must be poured in, to check or correct this alkaline tendency which is held so peculiarly to attend putrefaction. The volatile alkali, it is affirmed, is set loose, and acids must be given to overpower it.

The most valuable and efficacious *salts* and *earths* in my catalogue, are combinations of alkaline bases with acids; and on their decomposition it is alledged their acid, and not their alkali, allays the troublesome symptoms, and relieves the sick from their distress. Peace be to such reasoners! The reply to their objections is very concise, and may be summed up in few words—*that universally, and without a single exception that I remember, all acids have a stronger elective attraction for pot-ash and soda than for ammoniac; consequently the volatile alkali, if it existed there, could not decompose a single neutral salt that has a fixed alkali for its base.* Such persons as hesitate to take this declaration upon my authority, may, perhaps, find satisfaction in examining the first twenty-five columns of BERGMAN's second table of chemical attractions. And as to *ammoniac*, the advocates for the alkalescency of putrefaction should never administer it at all in intestinal fevers, as thereby they must, upon their own principles, augment the disease, and make every symptom worse. And the absorbent earths, *lime* and *magnesia*, even in their aërated forms, must be wretched prescriptions in such cases, if administered only for the sake of the carbonic acid gas they may afford.

Upon the whole then, the gastric liquor and the gall may be considered as the two great opposers of putridity in the stomach and small intestines. When these fail to perform their respective functions, a diet in which much septon, or principle of putrefaction prevails, may turn to the oxyd of septon, or to septic acid. When, in such cases, the substances enumerated above are administered, they act as alkaline salts; and while the weaker acids are set loose, the septic acid turns them respectively into septites of pot-ash, soda, ammoniac, lime and magnesia. If there is no septic acid in the alimentary canal, the neutral salts in my catalogue undergo no decomposition, and exert their several respective sudorific, cathartic or diuretic powers without interruption.

Look now, after this explanation of these matters, into the books, and examine what the febrifuges are. FULLER's *Body of Prescripts*, a work published near the beginning of the eighteenth century, by a Cambridge physician, which lies now at my elbow, furnishes several receipts of this kind, with comments. He affirms (*Pharmacopœia Extemporanea*, p. 63.) "that a *decoction*, made by boiling eight scruples of salt of wormwood, (carbonate of pot-ash) and four ounces of white sugar, in a quart of water, was an effectual medicine, and especially to be prescribed when a remitting fever would not obey the *cortex*, and began to threaten running over to the party of continual fevers." *Salt of wormwood* and spirit of salammoniac constitute (ibid. p. 101.) a considerable share of the active ingredients of the febrifuge *draught*, "which," he says, "gives relief in intermitting fevers, especially in such of them

as invade with cruel cold, shivering, shaking fits, that continue long."—"*Red coral levigated* and *salt of wormwood*, with lemon juice and cinnamon water, forms a *mixture* which wonderfully, (ibid. p. 299.) and almost miraculously, (like a god in a machine as they say) represseth subversions of the stomach, and motions to vomit. I have many times observed, that in continual fevers, miserably afflicting with anguish at stomach, and symptomatic vomiting, more good hath been done with this medicine alone, than with all that I ever could, by anxious study and various trials, find out." Salt of wormwood also enters into the composition of his febrifuge powder. (Ibid. p. 383.)

Riviere, or *Riverius*, the French physician, who practised at Montpellier above a century back, was very fond of *pot-ash*, insomuch that he gave the name of "febrifuge" to water impregnated with salt of tartar. (Observat. de Med. Centur. iv. Obs. 97.) His febrifuge *draught* (Centur. ii. Obs. 66.) was composed of vitriolated tartar, (sulphate of pot-ash) in some decoction of wormwood; (Cent. i. Obs. 54.) and his method of restraining vomiting in malignant fever was, by administering a scruple of the salt of wormwood in a state of effervescence with lemon juice. (Ibid. Cent. i. Obs. 15.) Though what he seems to have valued more than all his febrifuges, is a *mixture of calomel and jalap*, which he describes in the following enigmatical terms: "Ce precieux me-"dicament est donc composé d'un triple Hercule elevé a la plus "haute noblesse par douze travaux, auxquels est enfin ajouté un "quatrieme athlete qui, acheve l'accomplissement de l'ouvrage." (Cent. iii. sub finem.) To *mercurius dulcis*, six or seven times sublimed, he gave the name of *Calomelanos*, and often prescribed it in the quantity of a scruple, with half the weight of resin of jalap, or scammony. (Cent. iv. Obs. 97.) What a confirmation of modern practice, by the experience of the French physician, often and often repeated more than an hundred years ago!

There would be no difficulty in collecting other examples of similar practice; and, as I have cited an *English* and a *French* authority, I shall also quote the sentiments of a Scottish writer. Cullen (First Lines, &c. § 153 and seq.) of Edinburgh, enumerates *neutral salts* among those remedies which, when taken internally, are fit to determine to the surface of the body. He bestows on them great praise for the power of putting an end to the cold stage of fever, and of stopping vomiting. He mentions particularly the composition of an alkali, with the native acid of vegetables, and ascribes more or less of the same virtue to all the neutral salts, not excepting the combinations of ammoniac.

Thus, from the examination of the causes of pestilential distempers, there is good reason to believe they arise from septic acid inhaled from without, or generated within the body, and that this

acid is truly a poison; and from an investigation of the composition of a large class of the remedies successfully administered in such cases, and their manner of operating, there is equal cause to be persuaded, that they are antidotes to this poison, and are so by virtue of their alkaline qualities.

After all that has been stated, I should however be more diffident of the conclusiveness of the argument than I am, if the analogy of other poisons did not give it powerful collateral support. And here, facts from the north of Europe, and the south of Asia, corroborate the inference I have drawn, by their united force.

There is a loathsome disease described by *Chevalier* Back, (Van Troil's Letters on Iceland, Letter 24.) called *Elephantiasis*, liktraa, or scurvy, which is known in *Madeira*, and the *Ferro* Islands, but is particularly distressing to the poor inhabitants of Iceland, and the districts of Abo and Oesterbottn, in Sweden. It is caused by the manner of life and diet of the needy and wretched natives, who, besides exposure to wet and cold, frequently feed upon corrupted, rotten fish, fish-livers and roe, fat and train of whales, and sea-dogs, and congealed and sour-milk, with little or no vegetable provision. One might guess, with tolerable accuracy, what would be the consequence of a long continued diet of this sort; which, to use the phrase of the country, makes those who are infected with it in its highest degree, resemble *a putrefying corpse more than a living man*. Offensive breath, perpetual thirst, strong propensity to sleep, and difficulty of being awakened, shortness of breath, want of animal heat, brown and blue colour of the eyes and lips, &c. joined to an infectious quality, or power of being communicated, in some circumstances, from person to person, shew to what length septic mischief may run, even in those cold countries, and what singular appearances it may wear.

This formidable disease has been cured by Heberden. He gave his patients a little electuary of Peruvian bark and sassafras root, kept blisters constantly between their shoulders, and caused their hands and feet to be rubbed, night and morning, with a mixture, consisting of eight ounces of brandy, *one ounce of ley of tartar, and two ounces of spirit of sal ammoniac*. A five months course of this treatment was successful, after mercury, antimony, &c. had been tried full seven years, without any lasting amendment.

Mr. Williams has made a statement of facts, (Dissertations on the History and Antiquities of India, miscellaneous pieces, No. xvi.) relative to the cure of persons bitten by poisonous serpents in the East-Indies. It hence appears, that the poison of the cobra di capello, and other snakes, is effectually counteracted, even after symptoms of great danger have come on by the external and internal use of eau de luce, or of caustic volatile alkali, and that with surprising quickness.

You, by this time, suspect, no doubt, that other poisons are acids. There are, indeed, other facts that evince the same thing. If I stopped here, you might justly address me in the words of Solomon, "Go to the ant thou sluggard, consider her ways, and be wise." This insect is furnished with a poisonous liquid, which it infuses into the wounds it inflicts upon its enemies. This animal poison changes the blue colour of violets to red, (2 NEWMAN, &c. p. 324.) and forms a neutral salt with pot-ash. (2 FOURCROY, p. 824.) And it is told, on the authority of Mr. HOOK, that the stings of *bees*, *wasps*, and *hornets*, likewise emit liquids of an acid nature, which those creatures discharge on being irritated; and it is related, on the same evidence, (Micrograph, p. 142.) that the thorns of the nettle plant, (urtica) have sacks, containing a poisonous fluid at their bases, and holes near their tips, through which it is emitted very much after the manner of the fangs of serpents, and the stings of insects. *This* poison will probably turn out to be an acid, and throw light upon other poisons called vegetable. Wherein the formic acid and the poison of nettles peculiarly differ from each other, and from the acid of serpents, and the acid of pestilence, I do not pretend to know. At the same time I think it not improbable, that to whatever cause their small degrees of difference may be owing, *they all have an azotic (septic) basis, and the great traits of their character are the same.*

Your note from Manchester of August 6th, 1796, together with the papers accompanying it, on the subject of the medical and municipal regulations adopted in your great manufacturing town, were very acceptable to me. Distempers of a kind deemed infectious, are now and then prevalent among your people, as well as among the inhabitants of our American cities.

May "the sting of death," which is so often poisoned with an acid, never penetrate you, while your benevolence shall continue to be exerted in bettering the human race—When this ceases, "your corruptible may put on incorruption" (PAUL writes like a philosopher) as soon as it pleases.

Yours, &c. &c.

SAMUEL L. MITCHILL.

FOREIGN.

Additional Account of the Use of NITROUS ACID *in Syphilis. Republished from Appendix, No.* V. *to Part* V. *of* Considerations on Factitious Airs, *by* Thomas Beddoes, *M. D. and* James Watt, *Engineer.*

NOT many days after the receipt of Mr. Scott's paper on nitric acid, the Editor was consulted on a singularly obstinate case of supposed Lues Venerea. Above ten months ago, the patient had slight gonorrhœa; and after the use of some common remedies he thought himself nearly well, when a small ulceration appeared on the *glans penis*. I am not informed whether this ulcer shewed the characteristics of chancre; but, by the advice of an experienced practitioner, he now took the mercurial pill night and morning, and rubbed in mercurial ointment. This course was continued for near eight weeks without any soreness of the mouth, or amendment of the ulcer. In about four months from the first seizure, under the continuance of the same plan, an ulcer appeared in the throat, and the medicines were exhibited more largely for six weeks—and he was at the end of this time rather worse than better. The patient was now confined to his apartment, and mercury used more vigorously in both ways. In the course of five weeks, the ulcer was reduced to a third of its former extent; its pain had subsided, and the gums felt slightly sore. After this time, the chancre (?) was in a fluctuating state, sometimes healing rapidly, and then spreading to its original dimensions; nor was any farther advance made towards a cure, though corrosive sublimate was employed alternately with other preparations of mercury. Eight months after the first attack, there was observed near the sore, a gangrenous spot; having nothing of the appearance of a spreading venereal ulcer, but exactly such as is sometimes seen after long mercurial courses. The mercury was reduced; cicuta applied, and taken with bark and sarsaparilla; a grain only of calcined mercury being given at night, with half a grain of opium.

The Editor produced Mr. Scott's paper, and recommended a trial of his method, to which the patient and his friends cheerfully consented. The nitric acid was accordingly taken with perseverance for six weeks, and for a time to 200 drops a day. Mean-

while the ulcer rather extended than diminished; its surface looked cleaner, but no tendency to incarnation appeared. Immediately on taking the acid, no sensation was felt in the stomach, either pleasant or otherwise, except during the first, second, or third days, when it griped a little—No increased warmth of the skin—no effect on the pulse. The night-sweats, (which were certainly less after the mercury was reduced, and the bark and sarsaparilla employed) declined rapidly, after the acid was begun upon.

The acid being now gradually reduced to eighty drops a day, its inefficacy in this case became too apparent. The ulcer suddenly put on a worse appearance, and increased rapidly. Inflammation of the sound part of the glans, and a degree of phymosis, succeeded.

Opium, with bark, has been since advised, upon the supposition that the ulcer is a mere ill-conditioned ulcer, and now no longer of a venereal nature, whatever it may have been before the employment of mercurial medicines.

Dear Sir,

I RECEIVED your obliging favour on the day it was written, and perceive by its manner that you are as much and as agreeably surprized by the information Mr. H.'s Letter to me affords, as I expected you would be. I think with you that the Public ought to be made acquainted with the history of his case, together with the contents of his Letter; and as I have personally witnessed what he has recorded, I should have to accuse myself of inhumanity, if I were to suffer any personal considerations, that respect either my time, or my unwillingness to appear so often as a narrator of uncommon cases in one pamphlet, to prevent my furnishing you with all the particulars within my knowledge. I therefore with cheerfulness and pleasure undertake to give you, as far as I am able, with the assistance of my day-book and recollection, the account of a case that you say will conclude your pamphlet, "and make a noble conclusion." But as it may be asked, how I came to be acquainted with the effects of the remedy before its publication, it may not be amiss for me to state that, when Mr. Biggs, your Printer, furnished me with the proof-sheet for revision, that contained the account of Mr. Henderson's case, I was struck with Mr. Scott's communication which occupied the preceding part of the same sheet; and as soon as an opportunity permitted, I informed you, that I had a venereal patient under my care, whose case had resisted mercury in almost every known mode of exhibition, and that I should wish to try the nitric acid as there recommended, and requested that I might be favoured with your company when I visited the patient the next morning, as well to as-

sist me with your opinion respecting the appropriate dose, &c. as to give you a demonstration of the case being almost as bad as ever had been observed by any practitioner. You obligingly promised to be with me at nine in the morning; but about that time I received a note from you, wherein you informed me that a professional hindrance would prevent your being with me, and that upon reconsideration you thought the reasoning of Mr. Scott, who refers the advantages obtained "to oxygenation of the system," so unsatisfactory, that you would advise a very doubtful prognosis to be given to the patient, if he were put upon a trial of it. I was so much influenced by your opinion, that I should have omitted to make use of it, had I not the preceding evening shewn my patient Mr. Scott's account, and told him that he might expect a visit from you in the ensuing morning. A man in his situation, that had for nearly two years experienced the inefficacy of what he had been frequently told was the whole of the known remedies that the art afforded, was not likely to give up the use of that which was asserted to be a tried remedy in another part of the world, though it was unknown in this; and although I made him acquainted with the contents of your note, he was no way discouraged, but earnestly petitioned for its immediate exhibition. I have thus stated, in a plain and candid manner, the way in which I was led to its use. And if there should be any person, who, after what has been said, can suppose that any mistake in the nature of the case, or misrepresentation of the facts, can have happened—or (which is more agreeable to believe) if any gentleman should wish to ascertain, in a more particular manner, the facts that preceded and accompanied the administration of a remedy of so much apparent importance in a disease so hopeless, I am happy to say, that my patient's very laudable humanity would induce him to sink the consideration of what he might feel in satisfying such inquiries, in the hope of assisting, by his confessions, some unhappy fellow sufferer.

On the eighth of February, 1795, I was requested to visit Mr. ———, with pains of the limbs, and ulcers of the throat and tonsils, which, from appearances, suspecting to be a case of cynanche maligna, induced me to prescribe bark, wine, and gargles. That plan was persevered in until the 19th, without any advantage. From that circumstance, conjoined with the situation of his pains, and the times of their aggravation, I began (though my patient was married, and the father of healthy, fine children) to suspect the case to be venereal; and after expressing my suspicions, I learnt from him that he had contracted such a disease some years before, and had at that time an ulcer on the penis; but that he supposed himself perfectly cured, having passed through a regular course of medicine for that purpose: it was with difficulty that I

convinced him that his present sufferings were referable to such a cause. However, possessing his confidence, I prevailed upon him to commence a mercurial course, and he continued to take, from that time to the 8th of March, a grain of calomel, with an equal quantity of the ext. papav. three times a day, in the third part of a pint of the decoct. lignor. cum rad. mezerii. On that day, in consequence of the appearance of some eruptions, the form of the medicines was exchanged for the following:

℞ Hydrarg. Muriat. gr. iv.

Aq. cinnam. ℥ iv. *m* cap. coch. larg. noct. maneq.

This was continued until the 27th of April, and then a drachm of the ung. hydrarg. fort. was ordered to be rubbed into the thighs every night at bed-time, and the former medicine omitted on account of the eruption having yielded, though the pains had increased: this, with the decoction of the woods and mezerion, was continued till the middle of June. On the 20th of October, he began to take four grains of the blue pill, with a quarter of a grain of opium, three times a day; and it was continued, without intermission, until the middle of January, 1796. On the 14th of that month calomel, with opium, was again used in its stead, and continued until the middle of February. On the 12th of July, he again commenced its use, and continued to take it until the middle of August last, when I was obliged, by the fullest experience of the inefficacy of all the mercurial preparations that had been tried, to again request him to desist from the use of all medicines, except occasional opiates to mitigate his pain, which it had been necessary for him to use with the greatest freedom during the whole of the mercurial course. It will here be necessary to remind you, that when I first was called to his assistance I found him labouring under only the constitutional or secondary symptoms of the disease; and as I did not keep any minutes of the case, I cannot speak with that exactness I would wish of the particular effects of the different preparations of mercury that were exhibited. But I have the fullest recollection, that the ulcers of the throat and the affection of the skin were removed in due time by the means that were adopted: and although there was a complete failure in my attempts to dislodge the poison from the bones, I am not convinced that the failure resulted from the incompetency of the mercury to produce such an effect—as the constitution of this patient was rendered so irritable by the disease, or the means made use of, (or perhaps both) that I was never able to impregnate the system with a sufficient quantity to produce the desired effect; though it was exhibited with every precaution, and united with every corrective, that my judgment could suggest, conjoined with the advantages of country air, bark, milk diet, and the occasional omis-

sion of all medicines, which, for a time, answered so well, as to make my disappointment the greater at each time of the disease returning. At last, medicine of almost every kind failed to afford even relief, and I was reduced to the necessity of being content with the mere palliative effects of opium given in large doses. The peculiarities of this case are however too common; and every practitioner that is much engaged in a large city, especially if it be a sea-port, must have had to deplore such occurrences. It was my good fortune to meet with Mr. Scott's communication, in the way before described, just at the time when I had exhausted my endeavours to cure this patient—and when I say with him, that he was indeed a "rueful spectacle," with little more than diseased bones remaining, when he began the use of the nitric acid; and that he now appears in good health, I contemplate with astonishment the change that has been produced: more especially as he was always labouring under profuse sweats, diarrhœa, ptyalism, from the mercurials that were exhibited, though they were so guarded; and has now obtained a cure by the use of a most powerful acid, without experiencing even momentary inconvenience, and in less time than would have been requisite to remove even the mildest symptoms of the disease by any other known method. How much will the pleasure, that the effects here related have afforded me, be increased, if the future experience of my professional brethren should coincide with what was observed in this very melancholy case: and that it may prove so in cases that are similar I entertain the greatest hope, as the effects appeared to depend so fully upon the assigned cause, that no doubt can possibly remain upon my mind of the acid being the true and only cause of the changes that followed. It will be recollected that the poison had in this case observed its accustomed laws, and after traversing the system, and successfully displaying its character upon the genitals, fauces, and skin, it had affected the bones; from whence most practitioners have found it difficult, and sometimes impossible, to dislodge it. Perhaps it may not be difficult to conceive that a remedy, possessing such chemical power, and having so strong an affinity for the matter that analysis tells us constitutes bone, may produce a cure in this species of the disease, and not be attended with equal effects where only the soft parts are affected by the poison. That this stage is the most difficult to remove, and that it is often impossible to accomplish it, I have before said, is known to most practitioners. May this remedy supply the desideratum of this branch of the healing art, and the name of your correspondent, Mr. Scott, will then be deservedly remembered by every friend of science and improvement. Why should it be so difficult to believe the existence of other specifics for the poison in Europe, when it is recollected that the South-sea islanders, and

some tribes of the native Americans, have found, in the vegetable productions of their countries, remedies for the worst states of the disease?

I have thus endeavoured to comply with your request, as fully and particularly as the circumstance of my having kept no minutes of the case, will allow me; and as the recollection of the patient will be long kept alive by what he has suffered, I think that his own letter may be as satisfactory as any account from me of the situation he was in, when he first made use of the medicine that has occasioned his cure. And I can safely assert, that I believe his account to be a most faithful representation of his situation. You have seen it in his own writing, and he has been taught to expect a visit from you. I therefore request that you will, at an early interview with him, oblige me by satisfying yourself of the whole of what is here asserted; and then, if it be in time for your pamphlet, subjoin your testimony to that of

Your sincere servant,

Nov. 28, 1796. THOMAS BAYNTON.

To Dr. BEDDOES.

DEAR SIR,

PURSUANT to your request at your last visit, I take my pen to describe (if possible) the deplorable conditions and sufferings I have endured for near two years last past, and the almost miraculous deliverance therefrom, by your care and unwearied attention thereto.——I was first seized with ulcers of my throat and violent pains in my shins at night, that threw me into such perspirations, that for nine or ten mornings I was under the necessity of changing my linen before I could possibly get up; which was soon followed by or with excrescences or nodes from my knees almost down to my insteps, attended with violent pains in my head. My arms also were attacked with excruciating pains, where swellings of a considerable size made their appearance. My knees also swelled, and the pain so acute, that I durst not move them the least aside: sleep fled—nor did it return for ten weeks. And for twenty-two weeks I could not bear to be moved without suffering the most extreme torture, notwithstanding your tender care to administer every thing you could devise and prescribe for my relief. I knew you perfectly understood my case; but my disease seemed to baffle the power of medicine and every effort. Having for the then last thirteen weeks lived wholly upon milk, you advised me to discontinue the medicine, in hopes I might soon be able to make use of stronger food, and recover a little strength.

This treatment had the desired effect: and my pains for some time seemed to abate; but, alas! they soon returned again! when you advised another course of medicine, which operated more powerfully than it hitherto had done, and in a few months restored me so as to enable me to walk from my lodgings in the country to town. The satisfaction you expressed on the occasion I shall never forget, and with myself was in hopes of a radical cure. But at the end of three months, my hopes were destroyed by a violent relapse, which soon confined me to my bed. My legs (if possible) were worse than before; for not only my shins, but the main bones pained me dreadfully. One node formed (a little below my right knee) in a short time almost as large as an hen's egg. The pains from my shoulders to my fingers' ends I can scarcely describe. The sinews of my arms, thighs and legs, stiff and contracted—my fingers I could by no means bend; they were fixed by disease, and every joint swelled. The bones of my head shared equally with the parts I have described; and nothing but death was expected to put a period to such a scene of misery. Added to this, my body was a rueful spectacle, a mere skeleton; so that disease had nothing left but my vitals for its prey. This, Sir, is a faint description of the state and condition you found me in about three weeks ago, when you visited me, and with joy in your countenance told me, a new discovery had been made of a medicine that you had great hope would reach my case; and with your wonted goodness of heart cheered up my drooping spirits, by describing to me its mildness and efficacy in several cases similar to my own. Encouraged by this information, and relying upon your judgment, I was determined to give it a fair trial. I began, and continued to take the quantity as prescribed. —At the expiration of seven days I found it begin to operate, as you had before described, by creating a saliva in my mouth. On that day I had a desire to be lifted from my bed, and to sit up a little, which was done with some difficulty; but could not bear my feet on the ground, my knees also being in a very debilitated state —but found my pains greatly abated. I spit a great deal the next night, which was very thin, and not disagreeable. On the eighth day my pains seemed quite gone; and I requested again to get up, when to my great surprize I found myself capable of bearing the weight of my body on my legs. On the ninth day I was capable and absolutely walked from my bed to my chair, the distance of six feet, without assistance.—I bespoke a pair of crutches, but, thank God, I never used them, nor have had occasion for them; for on the tenth day I walked several times backwards and forwards my room without crutch or stick, or any other assistance whatever. On the eleventh day I walked from one room to another, and finding it attended with no extra pain, but stiffness and weak-

ness in my shins, I absolutely walked up a pair of stairs of fourteen or sixteen steps, and down again. My appetite was now restored to an amazing degree, insomuch that I found I could not continue the usual quantity of medicine (which in fact seemed to have operated more like a charm than a medicine) but I continue taking about three parts in four thereof daily. And I have the pleasure further to inform you, that I have walked out several times, and yesterday in particular I walked more than a mile, and was in hopes to have surprized you (which I know would have been an agreeable one) by paying you a visit at your own house; but was informed you was from home.—Be assured I shall always esteem it a pleasure to answer any queries respecting my case, and the efficacious operation of the acid in so wonderful a cure.

Believe me to be,

Dear Sir,

Bristol, Nov. 25, 1796.

To Mr. BAYNTON.

Nov. 29, 1796. The Editor, in company with another person, met Mr. H. at Mr. Baynton's. Mr. H. by word of mouth, confirmed the preceding statement; and added a variety of particulars respecting his former and present state. He said that his daily dose of colourless strong nitrous (nitric) acid was two drachms, diluted by a quart of water. The mixture produced no immediate sensation in the stomach. He was never griped by it; and he thought it rather astringent; for he had no stool in three or four days after beginning this course, which was unusual with him; but he would not take any aperient medicine, that nothing might interfere with the acid. On the seventh day he perceived a flow of saliva: on the eighth the salivation amounted to a quart; and it has continued in a greater or less degree ever since. There was no soreness of the mouth, or any of the feelings which had formerly been produced by mercury. In two or three days after this effect on the salivary glands, he lost his night pains. On being lifted out of bed, he was astonished to find he could stand without support; "whereas," said he, putting his hand on his knee, "these limbs could not before have sustained a single ounce."—The nodes, which were of the size of a hen's egg on the tibia, and of which there were several on the back part of the humerus and radius of one arm, began to diminish. The Editor, who had this interview three weeks after the first exhibition of the acid, found the tibiæ rough, but without excrescence; all the nodes

having disappeared. Mr. H.'s nose, which had been considerably enlarged, was now of the natural size. His hands, which had been "a mishapen mass," had no preternatural appearance. Before, he could not bend any of his fingers; now he could bend them all, but the forefinger of the right hand. A great difficulty of deglutition had disappeared at the commencement of the salivation. His general bodily condition had been much amended, and his appetite had become so keen, that he could hardly find time enough in the day to eat and to take his diluted acid.

This account fully confirms an important part of Mr. Scott's assertions. And the effect of the nitric acid in the instance of Mr. H. furnishes an additional probability that the first case in this Number was not venereal, when the patient began to take the acid. The result of that case goes some way towards determining the limits of its power, which cannot however be fixed without a number of experiments. The Editor has the pleasure to add, that he has before him a letter from an accurate medical observer, in which he says that "he has used nitric acid with great advantage "in some cases which he believed to be hepatic, and in one venereal "case with apparent advantage."

An ingenious friend had conjectured from Mr. Scott's paper, that nitric acid only renders the system susceptible of the mercurial stimulus. But Mr. H. took no mercury between the middle of August and the second week in November. In the effect too on the mouth Mr. H. remarked a striking difference.

The Editor flatters himself that to have ascertained the mild action of the nitric acid in these two cases, and its effect in checking night-sweats in the first, will, in all likelihood, prove advantageous to medicine in various respects. The personal examination of Mr. H. has put it out of his power to doubt of the utility of Mr. Scott's practice. He reckons his success among the fruits that were to be expected from the cultivation of the pneumatic physiology. He felt from the first that his particular speculations were precarious, and he some time since gave up his supposition relative to the state of the system in consumption. *(See second Edition of parts* I. *and* II. *of Considerations.)* But he was confident that if he could fix the eye and the mind of his medical contemporaries on those agents, upon which the mechanism of life so immediately depends, they would not fail speedily to acquire much of that power, which the knowledge of nature confers.

The discovery of every new *specific* (or substance capable of correcting given morbid actions of the system) affords a new reason for believing in the existence of others. For some scrophulous ulcers we seem to have found a new specific in sorrel: for venereal and hepatic affections, in nitric acid, such as we possessed before in mercury. These are diseases, in themselves not many

degrees less formidable than cancer and consumption. We have analogies enough to persuade us, that there is no lesion of organization, induced by the powers of the living body modified in one way, which the same powers, differently modified, may not repair; and that, by dint of frequent ventures, some happy hand will draw from the lottery of Nature a remedy for each of those diseases, which at present most baffle the physician and torture the patient.

THE

MEDICAL REPOSITORY.

VOL. I.—No. III.

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1798.

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ADVERTISEMENT.

WITH the publication of the third number of the Medical Repository, the Editors deem it proper to inform the subscribers, that the increasing subscription for the work renders it probable that it will, in the course of a short time, obtain a satisfactory establishment. The Editors indulge a hope that this will incline those who already patronize their undertaking, to pardon such irregularities in its distribution, &c. as may be perceived in its present state of immaturity. The embarrassments of this kind are numerous, but are, no doubt, surmountable, and will be gradually removed. The period of their existence will very much depend on the encouragement which the plan shall experience.

As it is the design of the Publishers to annex a list of subscribers to the present volume, they will thank such gentleman as have received subscriptions for the Repository, to return the names of the subscribers, with their proper address, to either of them, or to the printers, by the first of the ensuing May.

New-York, February 1, 1798.

ERRATA.

Page 300, line 21, for *creeks* read cracks.
316, line 16, for *air* read aid.

MEDICAL REPOSITORY.

VOL. I.—No. III.

ARTICLE I.

A SKETCH OF THE MINERALOGICAL HISTORY OF THE STATE OF NEW-YORK.

By SAMUEL L. MITCHILL.

The Commissioner appointed to make a Tour through the State of New-York, in the Vicinity of Hudson's River, respectfully submits to the Society for promoting Agriculture, Arts, and Manufactures, the following Report:—

IN undertaking the task assigned to the Commissioner, the difficulty of collecting and arranging facts, to form a report so extensive as seemed to be expected by the Society, appeared, for a time, an unsurmountable obstacle. To make observations enough, within the short duration of five or six weeks, to complete a report of only tolerable extent, and to bring them together with but a moderate share of skill and accuracy, actually impressed his mind for a time with sentiments of discouragement. Having, however, accepted the appointment, he conceived it his duty to undertake something, and the result of his labours he now offers to his agricultural colleagues. As this is the first expedition of the kind which the Society has authorized, it is not pretended to exhibit a complete view of every thing worthy to be remarked in those parts of the country which the Commissioner has visited; far less in such counties as he has not examined at all. He judged it better to execute as much as he could, with fidelity and correctness, than, by undertaking too much, to tincture the whole mass of his materials, with inaccuracy or error. Beginnings, in works of this kind, are always the most arduous and difficult parts of the business. The Commissioner therefore hopes, the paucity of materials, and the manner of their arrangement, in the present report, may not im-

press the Society unfavourably as to this interesting object, but, on the contrary, encourage them to persevere in these inquiries, and, if possible, to procure something like an annual report of a similar nature.

DISCOVERY, NAME, AND SETTLEMENT.

HENRY the Seventh, king of England, employed Sebastian Cabot, one of his subjects, to discover a north-west passage to China; in attempting which, the navigator, in the year 1497, discovered all the north-east coast of America, from Cape Florida to 67½ degrees north latitude; the whole of which tract of country, the crown of England, as the phrase was, became intitled to, by *right of discovery*. Afterwards, in 1584, Sir Walter Raleigh, an Englishman, sent two vessels with people to effect a settlement, who landed at a place since called Roanoke, in Carolina, and took possession of the country in the name of the English sovereign, Elizabeth, calling it Virginia, in allusion to her being a virgin queen. Then, between the years 1584 and 1606, many voyages were made, by various English subjects, to different parts of this north-east coast of America, who took possession thereof for the crown of England, until, on April 10th, 1606, two companies were incorporated, by letters patent, from James, then king of England, by the names of the South Virginia Company, and the North Virginia Company; the limits of the former being between the lat. 34° and 41°, and of the latter, between 38° and 45°; by virtue of which, the South Virginia Company settled themselves first in the Bay of Chesapeake in 1607; and the North Virginia Company made no lasting settlement until 1620, when Plymouth, in New-England, was settled. In 1608, Henry Hudson, an Englishman, discovered what has been since called Hudson's river, whose mouth is in about 40′ 20″ N. This mouth, and considerable part of the river, lie within the limits of both the said corporations. Hudson, without licence from his sovereign, sold his discovery to the Dutch: under colour of which, the Dutch West-India Company made settlements on Hudson's river. Sir Samuel Argal, Governor of the South Virginia Company, conceiving the Dutch as intruders upon his territory, drove them off in 1618.

In the year 1620, King James I. gave the Dutch leave to build some cottages on Hudson's river, for the conveniency of their vessels, bound to and from Brazil, touching there for water and provisions; under which licence the Dutch settled a colony, then called New-Netherlands; which colony of New-Netherlands appears to have included all New-Jersey and Hudson's river, and the

greater part of what is now New-York and Pennsylvania, lying on both sides of New-Jersey.

Complaint having been made of these proceedings of the Dutch, by Charles I. to the States General, the business was disowned by them, and declared, in a public instrument, to be only a private undertaking of the West-India Company of Amsterdam. By these people, the town, then called *New-Amsterdam* and *Manades*, which is now the city of New-York, was begun on the south-west of an island called *Manhattens*, near the mouth of the river.

After this, the Dutch nation remained in possession of the New Netherlands until 1664, when Charles II. sent an armed force to dispossess them; whereupon, on the 27th of August, in that year, the Dutch, on being summoned, made a surrender thereof to Sir Robert Carr and Colonel Nichol.

On the 12th March, 1663-4, King Charles II. in the sixteenth year of his reign, by letters patent under the great seal of England, gave and granted to his brother, James, Duke of York, his heirs and assigns, all Mattawacks, now called Long, or Nassau-Island, all Hudson's river, and all the lands from the west side of Connecticut river, to the east side of Delaware-Bay, together with all royalties, and the right of government; by virtue whereof, James, Duke of York, became seized of the same. Of this he sold all that part which includes the present state of New-Jersey, by lease and release, dated the 23d and 24th days of June, 1664, to Lord Barclay, and Sir George Carteret, their heirs and assigns, in as full a manner as he had received it. And this possession of the English was confirmed on the 21st of July, 1667, by the third article of the treaty of Breda, between Charles II. and the States General.

Afterwards, on the 30th of July, 1673, New-York and New-Jersey were conquered by the Dutch, during a war which was carried on between their nation and the English, under Charles II. and the English government abolished therein. Peace, however, being made between the contending parties, on the 9—19th of February, 1673-4, at London, New-York and New-Jersey were again, by virtue of the 6th article thereof, re-delivered to Charles II.

Then the letters patent were renewed by him to the Duke of York, for the before-mentioned extent of country, &c. on the 29th of June, 1674. Whereupon the Duke of York, by lease and release, dated 28th and 29th July, 1674, conveyed to Sir George Carteret, his heirs and assigns, all of what is called *East-Jersey*, bounded west by a strait line from Barnagat creek, to a certain creek on Delaware river, next below Rancokus kill; thence up the Delaware to the northernmost branch thereof, which is in lat. 41′ 40″ N. and on the North, by a strait line drawn thence to Hudson's river, in lat. 41; and, on the east, partly by the main sea, and partly by Hudson's river, with all the royalties and appur-

tenances; reserving to himself (the Duke of York) all the other granted tracts, particularly *West-Jersey*, which he held and governed, in spite of the claims of Lord Barclay and his agents, under the grant of 1664, until 1680, when the matter was accommodated between the assigns of Barclay and the Duke. The assigns of Barclay and Carteret came to a division, the former holding West, and the latter East-Jersey, in severalty.

The indefinite manner in which the New-York patents were expressed, rendered it difficult precisely to interpret their meaning. But as all Hudson's river was granted, the patentees, and their assigns, have taken possession of the country on both sides; and the territorial lines between New-York and the adjoining states of New-Jersey, Connecticut, Massachusetts, Vermont, and Pennsylvania, have been matters of special negociation, survey, and settlement, so that, at present, the state may be considered as included within the following lines:—

BOUNDARIES OF THE STATE.

THE state of New-York is included within the following limits: that is to say, within a line, beginning a little to the westward of a certain monument, placed by order of the British government, near the northern end of Lake Champlain, on the parallel of the forty-fifth degree of north latitude, where it joins the province of Lower Quebec, and the state of Vermont, and running thence through the middle of Lake Champlain, and along its deepest channel, westward of the Isle aux Motte, until, near the head of South-Bay, it comes to the mouth of Poultney river; thence along the middle of the said river towards its source, until, at the distance of thirty miles east of Hudson's river, it travels southwardly, until it strikes the north-west corner of the state of Massachusetts; thence along the western boundary of Massachusetts until it reaches the north-western part of the state of Connecticut; thence along the western frontier of the same until it reaches the East-river, or Long-Island Sound, at the south-eastern extremity of the town of Rye; thence along the margin of the Sound until it comes to the mouth of Haerlem river, near Hell-gate, and along that river to its termination in the North river, at Spuyton-devil inlet, and along the North river until it arrives at the forty-first degree of north latitude; and thence along the oblique line, forming the extreme boundary of the state of New-Jersey, until it strikes the river Delaware; and thence along the said river until it meets with the north-eastern corner of the state of Pennsylvania, in the latitude of 43° N. and along the same until it reaches the triangular gore, or tract of country, being on Lake Erie, northward of the Pennsylvania patent, and ceded heretofore by New-York

to the United States, and along the eastern limit of the same until it reaches Lake Erie; and thence along the said lake, and the strait leading the waters from it, to lake Ontario, and along lake Ontario until it comes to the river St. Lawrence; thence down and along the said river until it arrives at the forty-fifth degree of north latitude; and thence along that parallel until it comes to the place of beginning; including also the islands lying along the coast; to wit, the island of Nassau, or Long-Island; the island of Manhattens, or New-York Island; Staten-Island, Great Barn-Island, Little Barn-Island, the Brothers, Ryker's-Island, the City-Island, Hart-Island, Hurtleberry-Island, Gardiner's-Island, Shelter-Island; and a number of other small islands and beaches, some of which have human inhabitants, and others none.

DIVISION OF THE STATE, FOR THE PURPOSES OF AGRICULTURAL DESCRIPTION.

THE sea-coast of New-York is narrow; for though Long-Island presents a front of more than one hundred miles, yet its shallow bays, especially on the south side, admit no other than flat-bottomed vessels to come into them, except at the port of Sagg-Harbour, which lies in the large bay, situated between the two projections of land, terminated on the east by Montauk and Oyster-pond points. The distance on the main land, from the Connecticut line to the extreme point of Morrissana, is about eighteen miles to the most distant; of the island of New-York, not more than thirty; and across the bay, to the south-western part of Staten-Island, not much more than fifty.

The narrow limits of this state on the Atlantic, and its great extent toward the lakes, makes the description of it difficult, without including some part of the adjacent states. Transgressions will be made, however, not oftener than a regard to perspicuity renders necessary. The state, for the purposes of agricultural survey, may be divided into, I. CONTINENT. And this may be subdivided into, 1. The *granite country*, extending from the Sound to the termination of the Highlands, or first range of mountains. 2. The *slate country*, beginning where the granite ends, and underlaying all other strata, further westward, and northward, than the researches of the Commissioner have extended. 3. The *Lime-stone country*, spreading in some places to considerable extent, and, though scattered in various parts of the country, in large bodies, yet always superficial, and bottomed upon shistic or granitical rock. 4. The *Sand-stone country*, composing the Kaats-kill, or Blue Mountains, and some smaller strata, but always resting upon some deep-laid

and more ancient fossil bodies. 6. The *Alluvial country*, consisting of horizontal layers of clay, loam, sand, turf, and, generally speaking, all such matters as constitute intervale space between mountains and flat-land, along creeks and rivers. II. ISLANDS. And these may be classed as they are, 1. *Primæval*, as New-York, Staten-Island, and the north-side of Long-Island; or, 2. *Secondary*, like the beaches, hassocks, and marshes on the sea-coast, and all that part of Long-Island lying south of the spine, or ridge of hills which runs through it from east to west. As we have had no maps of Subterranean Geography, like those published in Germany, of the Hartz Forest, and in France, of the country around Paris, it cannot be expected the following descriptions of the earthy bodies, supposed to constitute the solid fabric of the interior part of the globe hereabout, will be perfectly correct and ample. Yet, however defective it may be, the Commissioner feels a confidence of its accuracy as far as it goes. Future inquiry must develope the rest.

DESCRIPTION OF THE CONTINENT.

1. *The Granitical Tract.*

THE whole extent of country, from the boundary of Connecticut, along the shore of the Sound, to the entrance of Haerlem river, is, with little exception, a rough and rocky coast. The streams of water that fall into the East river, are small and not very numerous; and the bays, by which the land is divided, are narrow, and extend but a small distance into the country. Granitical rocks and stones constitute the chief mineral productions hereabout; they extend to the North river, and are found on the west side of it, in the counties of Bergen and Morris, in the state of New-Jersey, where they form a large proportion of the first ridge of mountains. The great chain of these granitical mountains runs from north-east to south-west, or nearly so, and may be considered as arising in that spine or ridge, which extends from the neighbourhood of King's-Bridge, and running north, a little easterly, through the counties of Westchester and Duchess, on the borders of Connecticut, divides the running streams, and sends those which arise on its east side into Long-Island Sound, and those that issue from it on the west into the Hudson. The Taconic mountain, on the western part of Massachusetts, is a part of the same chain; and it is presumeable there would be no great fallacy in the account, if they were considered as terminating in the Green Mountains of Vermont, forming there a connection of hills and mountains, extending from north to south, almost from Canada to the city of New-York. This division of the country

includes the whole of the counties of Westchester and Orange, the southern part of Ulster, and the southern and eastern parts of Duchess, and the eastern parts of Columbia, Renssellaer and Washington counties.

The best views of the strata of the granite rocks are along the north side of the Sound, in Westchester county, and on both sides of the Hudson, in the counties of Orange and Westchester, and Duchess, as it passes through the Highlands.

The tide-waters in the Sound, oftentimes thrown into violent commotion by storms, have, in many places, washed away every moveable thing within their reach, and made bare large surfaces of rocks along the shore of the continent. In many places, the solidity of the materials opposes any further incroachments of the waves; but, in others, the proprietors of estates, terminating in promontories, points, and head-lands, of sandy or loomy earth, without rock, are suffering annual waste, by the undermining and tumbling down of their banks. In these places, the bare strata of rocks exposed to view, allow their disposition and structure to be accurately observed; and the perpendicular cliffs, in various places, permit their strata and composition to be ascertained. The rocks which form the basis of the soil, and constitute the chief materials of the mountains, are stratified; and these strata, like the mountains they compose, have a direction from north-east to south-west. These strata are of the vertical kind, and have, in no instance, any great declination toward the horizon.

They consist chiefly of quartz, feldspath, glimmer, schoerl and garnet, blended together in a great variety of forms. The quartz is of three colours; white, (Q. texturâ spatosâ & Q. purum Cron.) half-clear (Q. semidiaphanum) and reddish. The feldspath is both white, (spatum scintillans album) and red, (S. rubrum.)—The glimmer is sometimes colourless, (Mica pura) and sometimes coloured, of a brown or darkish hue, (M. colorata martialis.) The schoerl is both rough (Schoerlus figurâ indeterminatâ) and chrystallized, (S. chrystallizatus) and its colours are black and greenish. The garnets are of different forms, but commonly either bespatter the rocks in minute crystals, of a reddish cast, and friable texture, of a size nearly equalling very small shot, (granatus martialis) or of a larger size, and more determinate figure; they fill up the vacuities, and may be picked out of the interstitial spaces. (G. chrystallizatus.)

All these fossils may be picked up in their separate forms, and they are to be found too variously compacted and combined with each other. Now, one finds quartz in large lumps, adhering to considerable masses of glimmer; then connected with white and red feldspath, and then again with schoerl. Sometimes the schoerl predominates, and gives a black colour to the rocks. Sometimes

the quartz prevails, and their colour is grey or whitish. Again, the mica preponderates, and they thence acquire a shining or glistening appearance. There are instances too, where the red feldspath is the more abundant material, forming huge masses of red granite: according to the prevalence of one or other of these ingredients, is the rock of a whitish, grey, reddish, black, or shining appearance. And as these are varied in the veins, of which the strata are composed, so the stripes, or streaks, which run longitudinally through the rock, are diversified; and as the particles combined happen to be of greater or smaller size, and to be more or less intimately commixed, the rocks which they constitute will be proportionally streaked or speckled.

These strata are sometimes interrupted. The force and attrition of rivers from the upland, and of tides from the ocean, have, by degrees, worn down or torn away, not merely the soil, gravel, and stones, but large parcels of rocky matter. The fragments of these lie thick along the shores, coves, and vallies, where they often appear in solitary nodules, or piled upon each other to a considerable amount; or in sunken masses, whose summits, though visible at extreme ebb, are covered up at high water.

The strata are also interrupted by creeks and fissures. Some of these are longitudinal, or in the direction of the streaks and veins. Others again are transverse, and cross the strata at a right or some other angle. In many instances they wind curiously along through the solid rock in a sinuous or serpentine course. Their width is from a quarter of an inch or less to three feet; and, in some rocks there are spots where the fissure opens all of a sudden, for a short distance, to the width of a rod. These cracks are mostly injected full of other matter, though some of them are empty. The contents are, generally, a mixture of quartz, feldspath, and glimmer, sometimes separate, sometimes united two and two, sometimes all three agglutinated in large and coarse masses, and then again conglomerated more intimately with each other. And such is generally the disposition and structure of the rocks along the shores, and wherever, along the roads, creeks, or on the mountain tops, fair examination can be made.

The appearances on both sides of the Hudson, in the Highlands, are, in the main, very similar to those in the lower country. The rocks at Stony-Point, Anthony's Nose, Fort Montgomery, West-Point, and Constitution-Island, almost exactly resemble those already described. It must be remarked, however, that the channel, worn or torn by the river through these ridges of granite, exhibits much rude and picturesque scenery; and that the rolling off of rocks, and the crumbling down of hills, by the operation of natural or spontaneous causes, has spread through this region more than usual irregularity and disorder.

Within this district there is a range of rocks of another kind, which require particular mention. About fourteen or fifteen miles north of the city of New-York, the west bank of the Hudson, on the Jersey shore, becomes higher and more steep, till, at length, it fronts the stream with an almost perpendicular face of rock. From their commencement, to the southward of Closter-landing, to their discontinuance at Dobb's-ferry, and from their beginning again, north of Tappan, quite to Haverstraw, where they recede to the north-west, and leave the river, they are disposed in vertical strata. Perpendicular rents and splits divide them into oblong masses, or fragments, from top to bottom. Their height is such, that, from the top of them, west of Philipsburgh, an observer may see quite across Westchester county, view the Sound with tolerable distinctness, and terminate the prospect by the hills of Long-Island. Their appearance suggests to the experienced eye, the similitude of Basaltic columns. The Commissioner ascended them in several places, and satisfied himself the rocks were of that composition, *(whin, trap, saxum danemorense)* which constitutes a great portion of the figured Basaltes. Though no regular pillars fell under his observation, either in climbing aloft, or walking below, or examining them with a good spying-glass, as he sailed slowly by them, yet one of his intelligent friends assured him, in a conversation afterwards, that he had seen several of them with regular sides and angles.

A little westward of Fredidlker-hook, one of the highest of the Basaltic ridges, is a lake of about two miles in circumference. To those who are convinced of the volcanic origin of basaltes, this cavity, now filled with water, and inhabited by fishes, may seem the extinguished crater of the burning mountain.

These rocks have many tokens of having undergone fusion, by subterranean fire. In a number of places there is a spunginess and porosity in the stones resembling slag, and approaching somewhat to pumice. Both their vertical arrangement and their insolubility in water, oppose the idea of their being placed as they now are by the agency of that fluid. Besides, there is a circumstance relating to them, which strikingly exhibits the probability of their being some of the most recent mineralogical products of our country. This collection of *vertical* rocks is underlaid, from one end to the other, by *horizontal strata* of indurated clay, mixed with iron, or of clay and silex, with a ferruginous tinge; and by sand-stone, coloured reddish by a martial impregnation. This sand-stone, of which there are valuable quarries near Fredidiker-hook, is composed of silicious grit, clay, and glimmer, with now and then a thin layer of whitish or bluish clay, or clay and mica interspersed; and sometimes bits of semi-transparent quartz are found in it. On walking along the shore, between the mountain and the river, south

of Haverstraw lower landing, these horizontal strata may be observed; and large masses of the sand-stone obtained from them, intended for the builder's use, were seen by the Commissioner lying at the landing. Judging according to the analogy of other cases, and the most probable conclusion that reason can deduce from these appearances, the sand-stone may be estimated as a production, greatly more recent than the granite on which it rests; and the whin and basaltes, long since the deposition of the sand-stone from water, may be imagined to have been thrown from their subterranean abode in a melted state, and to have cooled and hardened in their present situation.

The chief œconomical use of these granitical and basaltic rocks is, for laying the foundations of houses, and for the construction of docks. Great quantities of stones for these purposes are obtained from the quarries, both on the East and North rivers, for the New-York market. On farms, they answer a very valuable purpose, in forming stone-fences for inclosing fields.

As to metallic substances, excepting the copper-mine a little above Newark, on Passaick river, the chief ores of consequence are those of iron. It has been mentioned already how many of the fossils are tinctured with this metal. By admixture with clay, it forms yellow, brown, and reddish ochres, occurring sometimes in large veins or strata. When combined with clay, in another proportion, it forms a solid cement, and conglutinates quartzy pebbles into solid masses. When united with clay and sulphur, in yet other circumstances, it forms yellow or martial pyrites, some of which is durable enough to preserve its compactness for a great length of time; while so loose is the coherence of the ingredients in other specimens, that the oxygene of the atmosphere is attracted by the sulphur, turning it to sulphuric acid, and dissolving the iron. The crystals of pyrites then lose their shining and cubic appearance, the mass crumbles down, and instead of a handsome metallic specimen, nothing is left but an efflorescence of copperas (sulphite of iron) and alum, (S. of alumine) mixed with clay. When iron concretes with thin layers of clay on the surface of the land, it causes that shelly or flakey appearance, so frequently met with in some parts of the country. Sometimes it is found in loose masses, which are chiefly red, brown, or black oxyds, and then, again, they are concretions of pyrites with quartzy gravel. In some places vast collections of bog ore occur in low grounds or swampy spots; and, in others, great quantities of upland ore are procured from the tops and sides of mountains. From among the granite rocks in the Highlands in particular, the inhabitants bring many tons down to the landings on the Hudson: thence it is carried away by water, and forged not only in the works higher up the river, but in those which are established in the eastern states.

This iron ore, some of which is magnetical, continues among the mountains on the west side of the river, for a long distance into New-Jersey, and is so abundant, that the works of Stirling, Ringwood, Mount Hope, Hibernia, Rockaway, &c. have been supplied with all their ore from these internal and neighbouring sources.

Before quitting this head, it will be necessary to mention that amianthus, in various forms, is found among the granitical mountains. That which possesses the longest and best fibre is in the north and south chain. Soap-rock *(Steatites,)* is found too in some places, of a quality fine enough for the lathe, *(lapis ollaris.)* The amianthus has been manufactured into paper, and the Commissioner's ink-stand has been turned out of a bit of the Steatites. Large rocks of stellated asbestos sometimes occur.

2. *The Shistic Tract.*

It had a long time appeared to the Commissioner an object of considerable importance, to examine the spots on the Hudson, where the great ridges of granite break off, on the termination of the first chain of mountains. The facts to be ascertained by such an examination would, as he believed, be of considerable importance, in settling some dubious points of geology, and have a considerable share in making out a rational theory of the earth. He, therefore, landed on the west side of the river, at New-Cornwall, a little to the northward of the Wind-gap, and walked back along the shore below the bank, quite to the foot of Butter-hill. Here, where the rocks had been washed bare by the water, he found what he was in search of. The granite terminated suddenly, and in some spots with almost the perpendicularity of a wall. The strata tending from south-west to north-east, naturally determined his view toward the opposite side of the river. In looking in the direction of the strata, Pollepell's-Island lay before him in direct range. He visited and examined this island, which he found little else than a huge mass of granite. Turning his eye again to the north-east, he observed a sort of point, or bluff, on the Fish-kill side, which, on being examined, proved to be the extreme termination of the granite there.

Having thus assured himself of the cessation of the granite at the before-mentioned bluff, at Pollepell's-Island, and at the northern part of the base of Butter-hill, the Commissioner proceeded along the shore for some distance, on both sides of the river, to satisfy himself of the natural appearances. He found there was an interval of forty rods, or thereabout, between the termination of the granite, and the emerging of the true shistus. This space, between the two great masses of materials consists, of common sand forming a

beach, on which lie nodules of argillaceous grit, quartz, white and red feldspath, shistus, concretions of small stones in an argillaceous cement, and iron ore. Just to the northward of this the slate rocks rise and form the margin of the river. It is highly probable, that the shistus takes a deep dip, and underlays the granite, and that the collection of sand and heterogeneous matters between the place where the latter ends, and the former makes its appearance, is formed partly by the alluvium of the river, and partly by the tumbling down of its banks. As soon, however, as the shistic rocks begin, may be seen numerous instances of their fissures being injected with quartz. The friable slate is broken in many directions, sometimes split lengthwise, sometimes cracked across, now rent obliquely, and then divided by crooked winding and ragged flaws. These openings in the shistic rocks are most curiously and exactly filled, even to the most intricate and minute ramification, with the silicious charge. In his walk, from the commencement of the shistic rocks to the landing at Newburgh, there were frequent verifications of the same thing before the Commissioner's eyes.

The obvious inference from these facts is, that in computing the age or duration of the different fossil bodies, composing the solid matter of the globe, a priority must be allowed to shistic rocks, notwithstanding the very great antiquity generally ascribed to the granitical tribe. It would seem, that, before the granite was formed, or while it was yet soft and fluid, the slate had become hard, and, from the operation of various causes, had been split and cracked in many directions; and that, while the shistic rocks were yet open and gaping, the quartzy substances found their way into the apertures, and filled them with a jet of silicious matter. And this conclusion in favour of the older date of the shistic rocks, receives additional force from the consideration, that most probably the granite is but a superficial stratum, grounded on a shistic bottom.

These slate-rocks are of considerable variety. They are, in some places, exceedingly compact, forming huge masses, or solid blocks. Then, though possessed of considerable hardness, they have a sort of scabrous or ragged appearance: in other spots they are of an exceedingly friable and shattered texture, crumbling easily to small pieces. In certain other situations they may be broken up in pieces large enough for building walls and furnaces. Some of those which are exposed to high degrees of fire, melt or soften enough to derange the works, and give evidence of a bituminous quality. There appeared some instances of shistus that might do for covering houses, and for slates to write upon, but the quantities seemed small, and the specimens not very promising. It is much to be hoped, when the country is explored to a greater depth that quarries of slate, fit for roofs of houses, may be found.

These shistic rocks prevail through a large tract of country. They appear to underlay all the lime-stone and calcarious earth. In many places they constitute a large proportion of the banks of the Hudson. At certain places they emerge from beneath the soil; and, in others, the waters of creeks and brooks has laid bare some of the strata. Shistic rocks form the basis of the beautiful cascade on Cornelius's-kill, about seven miles east of Claverack. They are visible in the creek, which runs through Watervliet, a little north of Albany. The Mohawk river, at the Cohos, or Great Falls, is precipitated down a ledge of shistic rock, and it continues much farther, and, I believe, in all directions. Even the Blue Mountains, as will be soon shewn, enormous as they are, stand upon a basis of slate.

The inclination of the shistic strata is sometimes vertical, then deviating considerably from the perpendicular, and then again the materials are jumbled together in all directions.

3. *The Lime-Stone Tracts.*

Calcarious earth is found in great quantity; and when it is considered of what importance it is to have plenty of lime-stone, marble, and marle, in a country, the disposition of great bodies of these substances, through various parts of the State, must appear a happy and bountiful provision of nature. The masses, or layers, of calcarious earth are every where superficial, and are bedded both on granite and shistus. There are some traces of it to the southward of Tarry-Town, and there is a great body of it at Verplanck's Point, just at the beginning of the Highlands; and at the foot of the Donderberg, on the west side of the river, there is another parcel of it. On the north side of the Highlands, there is an extensive tract of it on both sides of the Hudson. It runs, like the other great collections of rocks, from north-east to south-west. Traces of it are to be found on the west side of the north and south chain, which divides the waters running into the Sound from those that empty themselves into the North river. The southernmost extent of it, on the east side of the river, is a little to the northward of the Great Wappinger's Creek; and on the west side, about three miles above Newburgh landing. The northernmost termination of it, on the west side, is above Acker's-ferry, near Jew's creek; and on the east, a little to the northward of Barnegat. It seems to extend north-eastwardly quite to the Partition hills, and south-westwardly to a very considerable distance in the counties of Ulster and Orange. There is a quantity of it near the northern source of Croton river. Much of this calcarious earth burns into excellent quick-lime. Some of it is mixed with too large a proportion of flinty matter to be capable of calcining well. Other parcels of it again are susceptible of being smoothed and even polished for ornamental and

elegant purposes. There are some kinds that are of a crumbling and rotten texture, and others which possess very great hardness. There occurs, in several places, a sort of friable calcarious earth, of a white colour, lying in horizontal strata, and easily reducible to a white sand, which the inhabitants use for sprinkling on their house floors.

Calcarious earth is not confined to the very large collections just described, but in smaller quantity, and loose masses, is scattered through the mountains where the iron-ore abounds. That kind of earth which is used in the furnaces, to assist in fluxing and reducing the metal, is thus distributed about the country, where iron works are erected, in quantity sufficient for their use.

But calcarious earth is, in some places, filled with the remains of animals. There is a lump, or mass of lime-stone, in Columbia county, about half a mile west from the village of Claverack, and of about eight hundred acres in extent, which is remarkable for its petrifactions: it is a high ridge, the margin of which is, in some places, shelving, in others perpendicular, and, in others, almost overhanging the road as one passes along. Fifty or sixty rods after ascending the crags on the east side, the rocks are curiously figured all over their surfaces, with likenesses of sea shells; and, on breaking them to pieces, their internal substance is found to be composed principally of the coverings of marine animals. Although these materials are firmly compacted into stone, yet their shapes are often so intire and complete, that the species may be readily distinguished. But it is worthy of particular remark, that of the species there discovered, there are resemblances of the shells of several marine animals that are not known at present to be inhabitants of our coasts or shores.

This spot is distant about one hundred and forty miles from the ocean, and nearly four east from the fresh water of Hudson's river.

It is not intended to offer many reflections on these curious appearances. Certain it is, from the superficial arrangement of much of the calcarious matter upon the globe, and from the remains of animal substances which it apparently contains, much of the lime-stone may be fairly considered as of more recent date than the granitical and shistic fossils. The opinion to which modern philosophy leans, that all the calcarious earth in the world is to be traced back to the collecting labour and accumulation of animals, appears doubtful; for this plain reason, that if lime is a primitive earth, or elementary substance it, must have existed, in some form and some place, before animals could have been furnished with it. A right consideration of the matter will then divide calcarious earth into, 1. That which is coeval with the present mundane system; and, 2. That which has undergone solution

in the ocean, and other water or fluids of any sort, and has been directly precipitated from them, or, after having entered into the structure of animals, exists now among their relicks. The agency of animals in manufacturing the first kind is out of the question: the only inquiry is, how far their labours have been instrumental in giving its present form and qualities to the second. The Commissioner feels a persuasion, that, though real exuviæ of animals do indisputably exist in large quantities, in many parts of the earth, (see *Luidii* Lythophyl. Britann. Ichnograph. passim) yet there are some appearances, of shells particularly, which are of a very doubtful and imposing nature. It has been said, that there is a natural process, whereby, in the consolidation of a rock or stratum, the resemblance of a shell may be produced where no real shell ever existed. Some observers have gone so far as to declare they have witnessed the production and growth of them, from a microscopical smallness to a considerable size; and that, according to the particular arrangement and coherence of the particles, the figures of different species of testaceous creatures were counterfeited. Many of these supposed exuviæ are evidently crystallizations. Bodies, when taking upon themselves a crystallized figure, assume a greater variety of shapes than has hitherto been ascertained, after all the labour bestowed upon the subject. It is known, that, in the *Cotham stones* and *Florentine marbles*, both of which are lime-stones, there are representations of houses, castles, ruins, trees, rivers, &c. naturally formed, and to be brought to view by breaking and polishing: in these instances, nobody supposes the objects presented are genuine petrifactions, but only casual resemblances of certain things, occasioned by the peculiar arrangement of the particles of the stone. Why, then, may it not be allowed, that likenesses of animal substances may occur in the crystallizing process by which many calcarious rocks were formed? and in situations where, in fact, no animal, or part of an animal, ever existed?

Shistus underlays the whole of these strata and masses of lime-stone. The city of Hudson, a small distance to the westward of the spot just described, is partly built upon this kind of stone; and the same sort of slaty material abounds beyond Claverack to the eastward. In like manner, between Poughkeepsie and Wappinger's Kill, the spots can be easily found where, on the cessation of the lime-stone, the shistic rocks make their appearance from below.

4. *The Sand-Stone Tract.*

Besides the quarries of sand-stone in the neighbourhood of Newark, in New-Jersey, and those already mentioned as support-

ing the basaltes, there are yet other large bodies of it in the state of New-York. The most considerable of these lie back of Kingston and Kaat's-Kill, and form the second range of mountains, or the Blue Mountains.

They are partly in Ulster and partly in Albany county. They are commonly known by the name of the *Blue Mountains*, on account of a blueness or haze which they present to the eye when seen from a distance. They are likewise called the *Kaat's-Kill Mountains*, from a river of that name which issues from them and falls into the Hudson a little below Lunenberg. They are considered, and perhaps with truth, the highest land in the State of New-York; and though, by reason of their remoteness, not visible by mariners arriving on the coast, are however to be seen from a great distance inland.

They consist chiefly of sand-stone, *(lapis arenaceus)* which is grounded upon slate of a brittle and shivery texture, *(shistus fragilis)* some of which, when exposed to a high degree of heat, melts and gives evidence of a bituminous quality *(shistus pinguis)*. The layers of this mass of slate are of the vertical kind, or have an inclination of about from sixty to eighty degrees from the horizon; though in some places their order is disturbed, and there appears to be an irregular mixture or jumble of the materials together. In some places, quartz *(quartzum amorphum)* is blended with the slate; and in others, veins and fissures of the shistus are filled up with it *(quartzum granulatum)*.

The mountains are supported upon this *slaty* foundation. The rocks are composed of flinty sand, or grit and pebbles of various sorts, conglutinated, and piled up in vast horizontal strata. The particles of grit are not impalpable, but are easily distinguishable both by the sight and touch, seeming evidently to have been formed by attrition, prior to their being consolidated in their present form. The pebbles, or small stones, contained in the rock, are principally red and white quartz, sand-stone, and red jaspar *(diaspro rosso)*: all of them are of small sizes, roundish, and smooth, with every appearance of being water-worn, as they most exactly resemble the nodules lying on the beaches and shores of the Atlantic. Toward the tops are found petrifactions and impressions of marine shells, some of which exist in an argillaceous, and some in a silicious ground; and it is remarkable of these, as well as of those found in the calcareous stone at Claverack and the flint near Poughkeepsie, that though the clam and scollop shells are very plain, there are evidences of other animals quite as easy to distinguish, which are not found existing in our waters, nor along our coasts. The horizontal disposition of the strata continues from the base quite to the tops of the highest ridges, and a remarkable sameness prevails throughout the whole. The water

is exceedingly pure and good, giving no particular indication of a saline, calcareous, or metallic tincture; though it was said iron-ore was to be met with in certain valleys, and lime-stone in some places entered into the composition of the hills.

His expectation, when he set out upon the expedition, was, that the mountains were of the *primary* kind; but he experienced no small degree of surprise on finding all the facts before him bear witness of the recent formation of these huge masses. Every thing, from the shistic foundation upward, had a modern look; though without pretending to determine precisely when the mountains were erected on their present foundation, the beholder cannot refrain looking back toward that time, when the creatures that inhabited the petrified shells were alive; to that more remote period, when the sand and gravel which formed the shores where they grew, first acquired their smallness and rotundity; and to that still more distant æra, when the waves of the ocean, after having comminuted and smoothed the latter, gave animation and nourishment to the former.

It may be remarked, in general, that the course or direction of the ledges is, with variation of a few degrees, from north-east to south-west, in the secondary, as well as in the primary rocks; the arrangement here being no exception to the general rule prevailing through the continent.

Their most rugged and difficult ascent is on the eastern side, where perpendicular walls of different heights, from five to fifty feet, piled within each other, tier above tier, constitute, in some places, the rocky fabric and solid support of the mountains. Their nakedness is relieved by a coat of mosses and by shrubs, bushes and capillary plants, springing out of their cracks and crevices, wherever they can adhere or insert their roots; as well as by the tall and stately trees which cover the space between the top of one precipice and the bottom of the next. But notwithstanding this various covering, the larger divisions of the rocks can be seen for many miles, rising, as it were, step by step, to the summit. Towards the west, there is no corresponding structure, but the land shelves away gradually toward Schoharie-Kill, whose stream takes its rise in the mountains. The country behind them is consequently much more elevated than the tract between their foot and the Hudson; and by reason of their more easy access from that quarter, a number of the settlers who were discouraged by the eastern aspect, have ventured to come in from the westward.

Within half a mile of the spot where the waters divide, and run both east and west, there grow very large maple-trees *(acer saccharinum)*, whence some of the families manufacture considerable quantities of sugar. A white pine measured five yards and a third in circumference *(pinus strobus)*. A hemlock was more than

four feet across the stump *(pinus Canadensis Linn)*. A wild cherry-board *(prunus Virginiaca)*, at a saw-mill, was thirty inches wide. Spruce trees, of a size for spars and yards of ships, are plentiful in the same neighbourhood *(pinus Canadensis du Roy)*.

His route to the place where this heavy timber grows, was between two ponds, or lakes, surrounded by tall trees, and fringed with a green margin. They contain fishes; but as much of the water had evaporated during a drought which preceded the journey, they looked uninviting, and he did not approach near enough to throw in a line. The water issuing occasionally from these reservoirs, and collected from the rills trickling down the mountain sides, forms several brooks, which, seeking their way through the vallies, travel along pebbly and rocky channels, and, after falling into the Kaat's-Kill, empty themselves into the North River. Two of these, as they cross in their courses perpendicular masses of rocks, produce remarkable cataracts.

The first is on a branch of Kaat's-Kill, which, after a pretty rapid descent along its bed, first pitches more than two fathoms, and then running a few rods further, falls in a most beautiful sheet down a steep, which measured a little distance off one hundred and fifteen feet. At no great distance below, the water again falls more than one hundred feet, and continues descending with such violence and rapidity along its channel, that Mr. Lane estimates the whole descent, within one quarter of a mile, to be four hundred feet. The going down and coming up the rocks which form the sides of the valley are so difficult, that the bones of bears and deer are said to be frequently met with below them, owing probably to the animals, having descended to drink, and, not being able to return, starved to death there. The face of the rocks is worn somewhat circular, and is considerably excavated below. The stream is, of course, precipitated to the bottom without impediment, and very much divided into spray by so long a passage through the air. Between the fallen water and the rock, the space is covered with verdure, and the whole distance from the bottom to the top is beautified with plants, which find room for their roots, between the crumbling layers and among the mouldering parts of the rock. The mosses, maiden-hairs, strawberries, sumachs, and spruces, which have fixed themselves here, give to the scene a very lively and pleasant air; and, owing to the abundant evaporation, there is so little heat prevalent at this place, that snow remains unmelted until near the middle of June, between the descending torrent and the rock from which it is projected. Both sides of the valley through which the water hastens away, are composed of steep and lofty rocks, supporting huge trees, chiefly of the ever-green kind; and along this there is an extensive view of the mountain sides towards the east. Among the fragments, which, by the undermin-

ing of the water below, are, from time to time, breaking off in masses of many tons weight, and rushing to the bottom, and some of which are now hanging almost in equipoize, just ready to drop, the most luxuriant vegetation keeps out of sight the bare and disordered appearance, and, in a good degree, conceals behind its perpetual foliage, these ruinous and wreck-like appearances of nature. It luckily happened when we were there, the quantity of water was small, but from the size of the logs drifted down, and left by the subsiding freshets among the rocks of the channel, there was no difficulty in imagining how great and impetuous the flow must sometimes be, that could float such pieces of timber along, and split them to shivers in their fall. From the edge of the bank, a little way off, where several large trees afford a firm hold, securing the spectator from slipping, a tolerable view can be obtained. There is something in it exceedingly picturesque, which, under the pencil of an artist, would afford a sketch possessing much novelty and peculiarity.

The other cataract, called *Mitchill's-Falls*, is on the Kaat's-Kill itself. Exactly at the precipice, the mountain seems to have been rent asunder, and, receding to the right and left, leaves between its enormous and craggy piles, a deep and dreadful opening. This takes a turn toward the left, and winding along in that direction, the view is soon intercepted. From a point of elevated rock, a little to the left of the falls, the whole bend is full in prospect, extending, like a vast amphitheatre, from its commencement, just on the right hand, to its termination, by the intervening objects at the other extreme. A border of hemlocks and pines adorns the brow of the rocks; a like covering, mixed with laurels, *(kalmia major,)* and white cedars, *(thuja occidentalis,)* adown the steep, imparts to them perennial greenness; and the whole distance thence to the bottom of the chasm is skirted with similar trees and shrubs. Whether you look down or round, the prospect, though not extensive, is sublime and awful. The water first falls one hundred and sixty-two feet perpendicular, into a large bason, or excavation, in the rock below, of about forty yards in diameter; then, issuing from this pool, it suffers a second fall of eighty feet more, making, in the whole, a descent of two hundred and forty-two feet, as Mr. Lane measured it. To look down from the projecting layer of stone which forms the brink, is too dangerous for the most steady head. His guide, who would not suffer such an experiment to be made, caused him to lie prone upon the rock, and then creep forward, until the precipice was fairly before his eyes; and while he was held thus by the feet, he got as perfect an idea as he could of that part of the scenery. As this, when contemplated under such circumstances, was not wholly satisfactory, and as it did not appear practicable without a very fatiguing and circuitous walk to

descend the crags, and look at the cataract below, he reluctantly departed without seeing so much as he wished. Upon the whole, however, it may be safely observed, that though the quantity of water is less, these falls are more worth the seeing, than those of Passaick, the Cohoes, or the upper ones of the Mohawk.

On climbing the highest part, called the Round-Top, he frequently met with the paths of wild animals, in which the fresh tracks of bears and deers were very plain to be seen. As he ascended, the vegetable productions became so different, that he had now entered a new climate, for here the white and black birch *(betula alba and nigra)*, swamp sumach *(rhus vernix)*, balsam-fir *(pinus balsamea)*, bass wood *(tilia Americana)*, with now and then an oak *(quercus nigra)*, were the principal trees; though even hereabout, in some spots, the spruce and hemlock grew plentifully, and among the underwood, besides the great and small moose-bush, grew the common gooseberry and blackberry. He had before observed the wild raspberry *(rubus odoratus)*, and the English, or garden raspberry, about half way up. The Round-Top is a level spot of several acres in extent. It is very thickly wooded, and its chief product, besides a few birches, is the balsam-fir. This is generally small, as are many of the trees thereabout, there seeming to be a gradual diminution of their size as you ascend. Among the balsam trees, the principal plant of note is a wood sorrel, which he took to be the *Oxalis tomentosa*, plentifully and thriftily growing.

From this circumstance of the top being not bald, but thickly covered with trees, it is fairly to be concluded, that not one of the Blue Range belongs to the *Alpine Class of Mountains*, whose character it is to reach what is termed the second region of the atmosphere, or at least so high that no trees can grow erect upon them. Among Alpine Mountains then, of which those of Switzerland, New-Hampshire, Lapland, and Peru, are instances, being such upon whose summits either no tree can grow, or if a tree should, by accident, be rooted there, it could not grow straight up, but, weak and dwarfish, would creep like a shrub upon the ground, the Kaat's-Kill Ridge has manifestly no claim to be enumerated. Besides, the want of Alpine plants is another weighty circumstance in determining their moderate elevation. Plants of this sort are mostly small, for they grow on the naked hills, exposed to all weather and winds; for the same reason, and because they usually grow in a barren soil, they are tough and hardy. Now, there is no evidence of sterility in this mountain top, nor were the saxifraga nivalis & hypnoides, rhodeola rosea, cerastium tomentosum, sibbaldia procumbens, rumex digynus, or any of the Alpine plants he had seen elsewhere in their native places, or that are to be met with in botanical enumerations, to be found

here. Nor does he remember to have noticed a single willow *(salix)*, six or seven species of which are frequent in high stations.

From several places at and about the Round-Top, he and his companions climbed trees to enlarge their view of the surrounding objects; they, at last, adopted the most effectual method of bringing them in sight, by cutting down the trees and opening an avenue. With some labour this was effected on the eastern side, whence a prospect of the country between the mountains and the Hudson was obtained, as well as of the river itself, and the vessels sailing up and down it; and of the tract extending eastward as far as the Taconick Mountain in Massachusetts; while, from Kinderhook and beyond, further than Kingston, and the land stretching away southwardly on the other side of it, the eye comprehended the whole survey. From this place, the country lay as a map before them, and they took a bird's-eye-view of the hills, vales, woods and plantations they had travelled through in their passage here, which, on account of their distance, had now lost much of their distinctness, and, notwithstanding their inequality and roughness, appeared quite like a plain. They were now above the region of clouds, which, condensing below, obscured the view, and, for a time, took every terrestrial object out of sight; but dissolving again, and from time to time breaking away, partial observations could be got of the subjacent objects; and these, as they appeared through the mist and disappeared, afforded, together with the phenomena of water, suddenly precipitated from its solution in air, and quickly dissolved again, a curious and amusing spectacle. There was novelty in hearing thunder below them, and it was, besides, delightful to behold from one spot, so extensive a tract of the most fertile and populous part of the state of New-York, where the eye, instead of expatiating on inhospitable heaths and barren wastes, roves from one farm to another, and passes from improvement to improvement. This prospect will be greatly enlarged when the top shall be cleared of its wood; but even at this time, he recollects but one which he thinks surpassed it. This was in the west high-lands of North-Britain. The Scotch are very proud of their Loch-Lomond, and truly the lake, with its contained islands, and neighbouring mountains, exhibited a mingled scene of beauty and sublimity. From the summit of Ben-Lomond, there is the grandest prospect I ever enjoyed. Fortunately, when I was on it, the weather was so serene, and the atmosphere so free from clouds, that one of my companions, who had ascended the mountain more than a dozen times, said he had never had so fair a day. Southward, the lake, with its twenty islands, the village of Luss, the mansions of Cramstraddon and Bonhill, and beyond Smollet's sumptuous monument, beside the river Leven, the town and castle of Dunbarton, and the

Frith of Clyde, appeared beautifully in view; further than these, Port Glasgow, Greenock, the islands of Bute and Arran, and the Craig of Ailsa, together with a part of Ayrshire and the Atlantic ocean, lay fairly displayed. Westward, besides Loch-Long and Loch-Fyne, several of the Hebrides, and, in particular, the heights of Isla, the paps of Jura, and the mountains of Mull, could be clearly discerned. Northward, the stupendous Highlands, extending in the shires of Perth, Breadalbaine and Argyle, away toward Lochaber and Inverness, as far as the eye could comprehend, afforded a sight of rude grandeur and wild sublimity. Eastward, Lochard, Enrick-water, Loch-low, the city and castle of Stirling, the hills of Fifeshire, the river Forth, and the arm of the German Sea, were plainly seen; and had there not been a portion of haze toward the south, it was judged the castle of Edinburgh, Salisbury Craig, the Calton and Pentland hills, and Arthur's seat, might have been descried.

The Rein-deer-moss *(lichen rangiferinus)* was frequently met with in the Blue Mountains; and the peat-moss *(sphagnum palustre)* thickly covered the rocks in the moist atmosphere of the tops. The arctic liverwort *(lichen arcticus)* was very plentiful on many of the rocks; and, in short, the species of cryptogamous plants were so numerous, that the Botanist who is fond of investigating them, might here find a great deal of employment.

On his return, he crossed the High-Peak, which, next to the place he left, is the loftiest ridge, and found it covered with similar productions. The balsam-firs grow so frequent, that a man cannot, without difficulty, force his way through them. From the east side of this, by cutting away some trees and boughs, a noble prospect of the country was once more procured.

For the information of those who may be disposed to visit these mountains, it may not be improper to mention, that the middle parts are much infested by rattle-snakes *(Crotalus horridus)*, several of which the Commissioner saw, though he believes these serpents far less to be feared than common rumour allows, being convinced, both from his own experience and the information of others, that they seldom bite without provocation. The misfortune of losing some of the quicksilver through the leathern bag of the barometer, prevented the Commissioner's intended observations with that instrument; and the breaking of the stem of his thermometer in travelling through the thickets, deprived him of the satisfaction of ascertaining, by experiment, the boiling point of water, ether and alcohol on the mountain tops. The difficulty of carrying such instruments on an expedition of this kind is excessive; yet, it is hoped, some more fortunate traveller will succeed in making these trials.

(To be continued.)

ARTICLE II.

An INQUIRY *into the Cause of the Prevalence of the* YELLOW FEVER *in* New-York.

By VALENTINE SEAMAN, *M. D.*

THE following inquiry into the history of the epidemic Yellow Fever that has appeared in this city, at different times since the year 1791, was instituted for the purpose of ascertaining its most probable and essential causes. If I have succeeded, my end is answered, and my trouble fully compensated; if not, I still gratify myself with the thoughts of having established, with a considerable degree of accuracy, facts, that may be useful to some more fortunate inquirer.

The great difficulty of coming at the simple truth, even near at home, has made me cautiously avoid attending to hearsay stories of what has happened abroad; obscured by their distance, often warped by their relators, and too generally eagerly caught at by their favourers, and equally neglected by the adverse party. An instance of the impropriety of giving a currency to such fly-about tales, is glaringly exhibited in William Currie's letters to Benjamin Wynkoop: this *penetrating* man having convinced himself, notwithstanding a bulwark of opposing evidence, (Webster's papers on Bilious Fevers, and Bayley's Account of the Epidemic of 1795,) impassable by any body else, that the Yellow Fever that desolated our city in 1795, was introduced into it by the brig Zephyr. One naturally would conclude from Dr. Currie's account, that he had confined his inquiries merely to the superficial scum of newspaper observations, and flying reports; but his subsequent reflections prove him to have been acquainted with what ought to have corrected his premature and ungrounded conclusions. But these circumstances, so discordant to his wishes, it seems he has thought proper not to attend to, but rather to rest his opinions upon the slender support of his *ipse dixit* authority; while he soothes his feelings, by flying from the narrow path of reason and truth, into the unbounded field of hard-strained invective and feeble scurrility.

I cannot, in this place, forbear noticing the different effects that opposite opinions have had on the subsequent fate of Philadelphia and New-York. While the physicians of the former place,* I will

* I do not hereby mean to include all their phyficians, but only the majority of them, as feveral worthy characters among them have rifqued their very reputation at the fhrine of public welfare, in attempting to call the attention of that afflicted city to its true intereft.

not say, "*actuated by some malignant motive*,"* as I can hardly conceive human nature capable of such depravity, have been flattering the pride and vanity of their fellow citizens, with a notion, that their city was all-perfect, and its situation, in regard to healthiness, beyond amendment; and that to keep up a sharp look-out to their neighbours was all that was necessary; they have induced them to disregard that attention to cleanliness, which the terror of their first attack had driven them into; and hence have those who unhappily confided in their judgments, returned to their former neglect of domestic causes, which has again involved them in a calamity, as general, and, perhaps, as fatal, in proportion to the *remaining predisposed inhabitants*,† as that of 1793. In the meantime, the *learned* physicians, as they have, in a sneering way, been called, of New-York, have had honesty and independence enough to speak their minds freely, and to let their fellow citizens know, that "without the air of putrid effluvia, they need have no apprehension of a Yellow Fever *spreading* among them;" and their silly hearers, from being so weak as to put confidence in their opinions, have removed most of the suggested causes of pestilence; and hence have confined the effects of the disease, this year, to the narrow limits of a few filthy spots; and the number of deaths to within thirty: notwithstanding the severity of attack, and malignancy of the complaint, where it prevailed, were fully equal to that of 1795.

I shall not impose upon the time of the reader, with quotations from different authorities, in various parts of the world, in proof of the particular prevalence of Yellow Fever in places especially favouring the accumulation and fermentation of putrefactive materials of some sort or other; these facts being too well known to need recapitulation: but shall endeavour to trace the history and progress of the disease, for the purpose, if possible, of ascertaining its true cause, as it has occurred to my observation, in this city for several years past.

In the autumn of 1791, the Yellow Fever was considerably prevalent in a part of Water-street, in the neighbourhood of Peck's-slip, noted, at that time, for having the docks near to it loaded with every kind of filth that could be scraped up out of the adjoining slips, which had been long collecting every species of corruptible materials that the citizens wished to get rid of. (See also Jonas Addoms' Inaug. Dissert.)

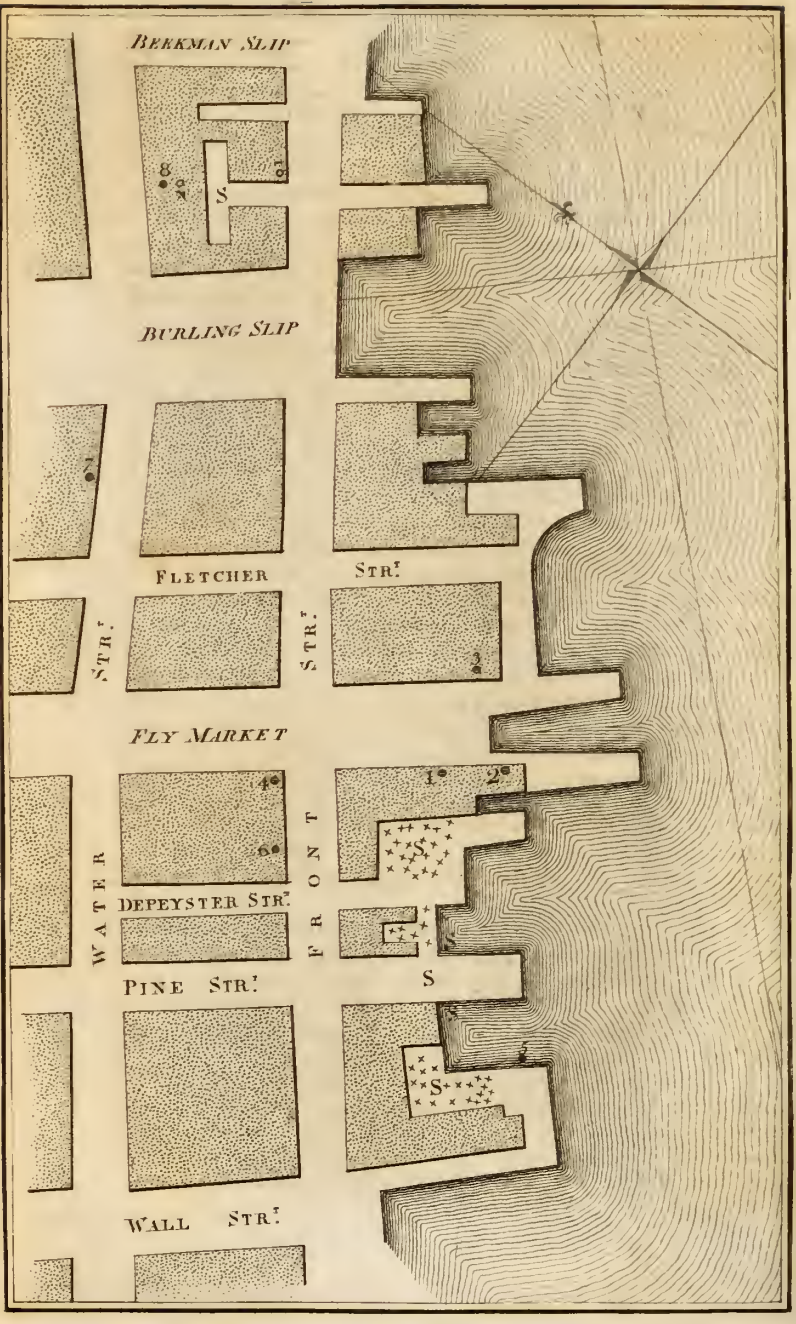
In 1792, at the season wherein those complaints mostly prevail, a long indisposition confined me to the house, and prevented

* Currie's charge upon those who dare to think differently from him.

† By the remaining predisposed inhabitants, I mean to include only such of those that continued in town, who had not undergone the complaint before, as a former generally screens us from a future attack, at least a fatal one.

Plate I.

New Slip
STREET
STREET
ROOSEVELT ST.
CHERRY
WATER
DOVER STR.
1
2
3
4
5


BEEKMAN SLIP
BURLING SLIP
FLETCHER
STR.t
STR.t
STR.t
FLY MARKET
WATER
DEPEYSTER STR.t
PINE STR.t
FRONT
S
WALL STR.t

my knowing much about what was going on out of doors, or of the state of the city, either as favouring health, or threatening disease. However, I did not understand that there was much alarm of Yellow Fever that year. Probably there was little or none.

Not, in 1793, was the alarm of Yellow Fever heard of among us, excepting from a few solitary cases imported from Philadelphia, and which was lost in the fate of the unfortunate individuals who had brought it from its source, without the least injury to the healths of our citizens, either in the capacity of friends, nurses, physicians, or neighbours; none of these patients, as far as I could learn, having been permitted to seat themselves in places abounding with putrefying substances.

The complaint in the year 1794, appeared to such a degree, as to occasion considerable uneasiness in the minds of many of the citizens. *The Committee for preventing the introduction of contagious diseases*, met regularly to establish measures for the welfare of the city. To them, in a communication made the 11th of 9th month (September), among other circumstances, I intimated as a reason for believing that it was supported by causes within ourselves, "That most of the patients that had been, or then were, "affected with dangerous fevers, were either such as resided in the "neighbourhood of the slips, (which then were or lately had been "cleaning out) or whose employment led them to frequent those "places; as cartmen, measurers, labourers, &c. at least such was "the situation of the cases that I had heard or known of, and "respecting which I had taken some pains to inform myself. I "then had, at that early part of the season, attended four patients; "and they were all of that description. Two of them were boat-"men, who lay at the New-slip; another lived not far from it; "and the business of the fourth obliged him to frequent the slips." It was observed, that during the very time that these persons were taken sick, the MUD-TURTLE (as the machine was called, the temporary suspension of whose operations was the object of that communication) was performing its pestiferous purgations on this filthy slip.

In 1795, that part of the town that bore the chief burthen of our calamity, was remarkably distinguished by peculiarity of circumstances and situation (aided by the singular regularity of our rains), seemingly well calculated for the accumulation and decomposition of all kinds of perishable animal and vegetable substances. (Webster's Collection of Papers on Bilious Fevers.)

The chief prevalence of the disease in 1796, seemed evidently fixed where, from our former experience, we ought reasonably to have expected it. For no doubt, at that time, the neighbourhood of the Whitehall, from the nature of materials wherewith a large dock was there filling up, aided by the noisome exhalations,

from the exposed bottom of the Exchange-slip at low water, must certainly have been rendered the most noxious part of the city. (Bayley's Letters, Medical Repository, No. I. Appendix.)

But it was not intirely confined to that particular neighbourhood in 1796. Four deaths from the Yellow Fever occurred, during that season, within fifty yards of where Roosevelt-street drain empties itself into an inlet which was then open quite up to the southerly side of Water-street; the bottom of which (S on plate I.) was frequently in part left bare even at high water. Every ebb-tide exposed at least eight hundred square yards of its surface, covered with the numerous perishable materials, furnished by the different streets of that crouded part of the town, which descend into this common sewer, in addition to the other putrid matters that such handy places are always collecting.

One of them, James Callender (marked .1 on plate I.) was an Irishman, who had resided about five months in this city, and was the first that I could hear of who had the disease in that neighbourhood. He died on the 22d of 7th month (July,) after a few days illness, with a yellow skin, and smelled extremely offensive, as I was told by those who assisted in burying him. Two others, of the above cases, came under my own particular observation, and were decidedly of that complaint. Both of these patients were foreigners just arrived from London. One of them (.2) I attended. He had been in town but five days when he was taken sick: On the fifth day afterwards, 19th of 8th month (August), he died, with coffee-ground vomitings and yellow skin. To the second (.3) I was called a few hours before his death, to determine whether he was a proper object for the New-York Hospital. He had been more or less indisposed, from the second day after his arrival, which was on the 2d of 10th month (October), but was not seriously taken till the fifth. He died on the seventh day of his disease, very yellow, but I know not what was the nature of the matter he puked up. I was told he had been much distressed by his sickness of stomach. The last (.4) of these four patients died the 20th of 9th month (September), after five days illness, with yellow skin and dark vomiting.

Another person also died with this complaint, some little distance off, in Cherry-street (.5). I saw him in the latter stage of his complaint, in conjunction with the physician who had attended him from the beginning; and we were perfectly agreed as to the nature of his disease. He died the 21st of 8th month (August), on the seventh day of his complaint, with yellow skin.

Besides these fatal cases, there were a number of persons also, that were seriously affected by severe fevers, but yet recovered, (designated ⊙ in the plate.) I attended three of this description; one of them lived in a house built upon piles, over a part of the

above-mentioned flat; another passed a great proportion of his time, during the day, in a store adjoining it; and the last lived in Cherry-street, and the yard of his house backed upon Water-street, about eight rods distant from the same spot. Dr. Borrowe informed me, that he had also attended one, at the corner of Water and Roosevelt streets, with the complaint well marked, and from which he, with difficulty, recovered.

There were several other cases of fever, of a suspicious nature, though slight and soon recovered from. Their situations are marked (o) on the plate.

It may not be amiss here to observe, that none, as far as I could learn, that had the fever in 1795, suffered with it in this neighbourhood this year, excepting one of the slight cases above-mentioned: Its general prevalence the year before was, perhaps, the reason why no more were affected about this spot this year; their former indispositions probably securing them against a second attack. This much is certain, that the nine patients first above-mentioned, had not had it in 1795. Indeed, seven of them might be said not to have been exposed to its cause; one having lived only a few months in town, two having just come from England, one absented herself from town in the sickly season, two had lately come from the country, and one that year lived at the Whitehall; and one of the others continued in town for only a part of the time during the epidemic of 1795.

Why the disease did not become as general about the easterly low part of the city in 1796, as in the year before, probably was owing to the removal of most of the causes that were supposed to have promoted such complaints; and perhaps also, in a degree, to not having such regular rains, to favour the deadly operations of remaining deficiencies. (See Webster's Collection of Papers.) Many of the lots in that part of the town had been filled up; the filth and dirt of the streets and yards had been more carefully cleared away; the unpaved streets, in general, had been paved and regulated, so as to prevent any water from standing in them; and several of the slips and vacancies under the stores set upon piles, had been filled up with wholesome earth. But, in this devoted spot, partial neglect, we see, was followed up by its predicted, I had like to have said merited, consequences.

It remains to notice the disease as it has shewn itself among us this season. The cases that have occurred being too numerous to attempt to get an accurate history of them all, and the want of proper marks to identify it where it is slight, if attempted, would, at best, leave but a very objectionable result: I have therefore only noted the fatal ones; nor do I think we need much to regret the omission of the others, since, from the number of deaths, we can nearly calculate upon its degree of prevalence, and particularly

since the proximity of cause will, most probably, correspond with its mortality.

To proceed. 1st. William Cummings, two days after having taken his lodgings in East George-street, was attacked on the 1st of 9th month (September), with chills, head-ach, and the other common symptoms of fever, which increased in the night with delirium, &c. The next day many circumstances giving occasion to suspect his complaints to be of a dangerous nature, he was carried to the Lazaretto, on Bedlow's island, where, in a few days, I have understood, he died.

2d. Margaret Wiggins, in the same street, was taken on the 14th of the same month. On the fifth day of her disease, according to the account of the person with whom she lived, she puked a black, offensive, ropy matter. Two days afterwards, on the morning of the 22d, she died very yellow, and with black effusions about her breast.

3d. —— Brown was taken the next day, the 15th, and died also on the morning of the 22d. He had vomited, during his disease, much blackish bloody matter, and was very yellow.

4th. —— Price, after having passed a part of the evening of the 16th of 9th month (September), in East George-street, was taken in his return home at midnight, with dizziness and lassitude, succeeded by a chill, followed by a hot fever, &c. He died on the 19th, very yellow; he had, during his disease, puked a black matter.

5th. William Templeton sickened on the 16th, with chills, &c. and died in the afternoon of the 22d, very yellow.

6th. John Busson was taken on the same day with Templeton. During his disease he puked much: the nature of the discharge I could not learn. He died on the 23d, with yellow skin, and blackness about his neck and breast.

7th. A lad, by the name of Parcells, died in Cedar-street. His mother lived in Henry-street, two doors from the corner of East George-street, where he used frequently to pass his evenings, and sometimes to stay the whole night. He became sick on the 19th, of the complaint of which he died on the 23d. According to the account of his physician, his must have been a decided case of Yellow Fever. He had the black vomiting and yellow skin.

8th. Seth Fairchild was taken on the 27th of 9th month (September), and died ont he 2d of 10th month (October), with black vomiting and yellow skin.

9th. George Ross was taken sick the 11th of 10th month (October), and died on the 20th. He had puked a blackish matter. His skin was yellow.

10th. —— Hulshart was taken on the 12th, and died on the 17th of 10th month (October). He was yellow, and had puked, during his illness, a greenish brown matter, and purged clear blood.

All the above cases appear to have originated in East George-street; and all, excepting Price and Parcells, resided within the small compass of seventeen houses, in the lower part of the street.

11th. On the 13th of 9th month (September), John Holmes, after having been a little complaining for a week, according to the relation of his landlady, was taken with a chill, succeeded by a hot fever, violent head-ach, red eyes, &c. On the 19th he was sent to the New-York Hospital, where he died on the 23d, with a yellow skin, after having puked up a dark brown feculent looking matter. He had taken lodgings in Chesnut-street three days previous to his indisposition.

12th. —— Havens, who lay on board a vessel at Lynch and Stoughton's wharf, from the time of her arrival, the 25th of 8th month (August), was taken unwell the 14th of 9th month (September), more unwell the next day, still more the day after, but not to such a degree but that he walked up to Roosevelt-street, where he took lodgings. He was confined the next day; on the 18th he was very yellow, and vomited, in great quantities, a black matter, mixed with coagulated blood, almost incessantly. He discharged the same by stool, and died in the night of the 19th.

13th. On the 17th, Samuel Suydam, who resided near the Exchange, in Water-street, but who passed the greatest part of his time, during the day, in his store, a little to the east of Lynch and Stoughton's wharf, in Front-street, was taken down with his complaint, which terminated fatally, on the morning of the 23d. His physician informs me, that his disease appeared to him to be a Yellow Fever of the most malignant type. He had the black vomiting to a great degree, and his skin was very yellow.

14th. —— Kelly (.1 of plate II.) was taken on the 7th of 9th month (Sept.), with fever, attended with a particular determination to his head, hot skin, and great derangement of his mind. His complaints being suspected of a malignant nature, he was conveyed to the Lazaretto on the 13th; where, a few days afterwards, he died.

15th. Daniel Wiggins, who lived in the lower house on the west side of the Fly-market, (.2) his physician tells me, was, on the 20th of 9th month (September), attacked with a fever, which assumed a most malignant appearance, attended with black vomitings and a yellow skin. He died on the 28th.

16th. John Van Deventer, (.3) as the family informs me, was taken on the 20th of 9th month (September), and died on the 29th, with a yellow skin.

17th. Samuel Hitchcock, at the corner of the Market and Front-street, (.4) sickened on the 23d, and died on the 29th, in Fletcher-street, where he had been conveyed after he became unwell. His attendant, in her simple narrative of his case, says, he puked matter just like the grounds of coffee, but he was not yellow.

18th. James Hamilton belonged to the schooner Ellice, which arrived on the 16th of 9th month (September), after eight days passage from Richmond, in Virginia. He was employed in assisting to unload her, at the easterly side of Murray's wharf (.5). He was taken sick on the 27th, and then took lodgings at the Crane wharf; where he died in the morning of the 30th, with pukings of a greenish matter, and with a yellow skin.

19th. T. Comstock resided in Front-street, between the Market and Depeyster-street (.6); he was taken on the 28th of 9th month (Sept.), and was afterwards carried to the New-York Hospital; where he died on the 3d of the next month, with a yellow skin.

20th. J. Rogers (.7) was taken in the night of the 20th of 9th month (September), with chills and sickness at stomach, followed by a hot fit, which was succeeded by a sweating. In the morning he was so well as to be about house. His complaints returned towards evening, without a preceding chilliness, and continued, with little or no abatement, till his death. He did not have much sickness at stomach, nor great pain in his head. The tunicæ conjunctivæ of his eyes appeared bloated, with a reddish yellow fluid: his skin was yellow; his pulse most of the time soft, and not frequent; and he was much harrassed with a very painful hickuping, with short intermissions, for about twelve hours before his death; which occurred on the morning of the 26th.

21st. Abel Beers attended a store in Water-street (.8). He was taken with chills, pains in his head, &c. on the 10th of 10th month (October), and died on the 16th. During his fever, which regularly remitted every morning, he was much deranged in his mind; his bowels were constipated, and stools, procured by art, dark; his eyes and skin became yellowish on the fourth day; he puked a brownish matter several times on each of the two last days of his illness, and vomited a great quantity of blood just before his death. After death, the skin was observed to be universally yellow, except that there were purple effusions about the neck, breast, and on the lower extremities.

22d. Elias Mowatt, in William-street, died on the same day, of a fever with which he was attacked on the 12th. During his complaint, he had, several times, puked a black matter: he had some yellowness about his neck.

From the foregoing list, which comprehends all the deaths from this fever, which have occurred in this city this year,* up to the present date, as far as I can learn, it appears that nearly one half

* Since writing the above, one other death, and only one, has come to my knowledge, and the present steady coldness of the weather and hardness of the frost, seems intirely to have checked the disease; it is not probable a single case of it exists in the city at this time.

of them originated in a small part of East George-street; and the greater part of the remainder near about, and just below the Fly-market. We are, therefore, naturally led to examine the situation of these afflicted spots, to ascertain the cause of its particular prevalence there. And, indeed, the southerly part of East George-street, where the complaint prevailed, (if we can suppose filth and putrefaction of any kind to produce it,) seemed well prepared for the purpose. The street itself, unpaved, was so rutted and broken up, in particular parts, as effectually to prevent it from being kept dry. Frequently, for some time after wet weather, it was almost impossible for footmen to pass through it, without miring half shoe deep; and, at the best of times, one fourth of this particular part of it was a filthy mud-puddle. Besides this, most of the houses are occupied by several families; all of whom have the yard in common; and really, upon inspection of these places, all of which are lower than the street, one's mind is struck with an idea that the several joint-tenants are not only determined not to clear away the other's dirt, but also that each one exerted himself to put, *at least*, his share into the noisome collection; because he had as good a right to make dirt as his neighbours. Hence these sunken spots became a dreadful mass of garbage and offal matters of every kind. This, however, was not the case with all: One house, the cellar of which contained fourteen persons, men, women, and children, black and white, all huddled together, having no yard at all. But here there was no loss in the end; for what of every refuse and excrementitious matter the yard would otherwise have gained, was here thrown into the open street; the common place for all kinds of putrefiable substances. But, beside this, at the upper part of this affected portion of the street, between four and five rods up Lumber-street, is a declivity that appears to crave every kind of rubbish that comes near it; nothing seems to be too gross for it; even the night-man's filthy load, as I have observed, here finds a free reception.

The cause of the prevalence of this disease near the Market, appeared very evident upon examining the spot. The south-eastern end of Pine-street, (S on plate II.) lies considerably lower than the dock which is continued from it; so that it there keeps a constant puddle of stagnant filthy water and mud. But this is a mere trifle in comparison to its pestilential neighbours. The slips (S S) on each side of this central spot, have been left, during the summer, to be fortuitously filled up by the free contributions of the neighbourhood. Hence they became the common receptacles of rubbish and filth of every description. I have seen in them the guts and trimmings of fish, shavings, the clearing of shops, mud, that appeared to have been the cleaning of sinks, cabbage leaves, potatoe peelings, &c. &c. and further, to render this noisome collection the more complete, the necessary night-man did

not fail to do his part: more than once have I observed their fulsome loads exposed in these places, and that even above the ordinary mark of high water. But beside all this, the spaces on the annexed plate, marked S with crosses, particularly that to the north-eastward of the dock, has, from its being open and so contiguous to the Market, become the common convenience to a multitude of people; and indeed so effectually have they bespattered the ground with their excrementitious depositions, that it requires a good degree of circumspection in walking there, to tread clear of the filth.

Havens and Suydam appear to have taken their complaints in an atmosphere contaminated by the emanations from the exposed flat at the inlet by Lynch and Stoughton's wharf. This inlet, including the spaces under the adjoining buildings on each side, which are set upon piles, exposes a surface of mud and every kind of filth that is constantly gathering in such places, of at least one hundred square yards at low water: and, as though it was feared that the parts under the stores should not receive their share of what is so freely thrown into such reservoirs, several of the boards of the platform before the door are left loose, so as to be taken up at pleasure: and, indeed, the pile that is heaped up under the opening shews that it has well answered its purpose. Still more completely to involve this dock in the most offensive effluvia, at the end of it is affixed a conveniency, erected, it is true, over the water; yet, with seeming care, such obstructions are introduced under it as to support great piles of matters, not less offensive to the smell, than disgusting to the eye. Havens attended and slept in a vessel that lay at this very wharf; while Suydam attended his store about eighteen yards from it, and in a direction for the regular southerly wind to blow the whole power of this loaded atmosphere upon him.

Rogers lived in a part free from the circumstances attending the residence of the afore-mentioned persons. Might he not have picked up his complaint at the Market?

Beers (.8) spent the day in a store between Beekman and Burling slips, which is remarkable for backing upon an inlet in the form of a T, that opens into Front-street. This place is unpaved, and, too much like many of the Philadelphia alleys, is bounded by the backs and gable ends of houses, and by yards, without a single house fronting it. It contains upwards of 200 square yards; one third of which, at the most moderate calculation, is constantly covered with mucky filth of one sort or other. It may be thought strange that this place should furnish us with but one death. This may have been owing to two causes. In the first place, to its being surrounded, in great degree, by stores that are only inhabited during the day; and secondly, to most of the inhabitants near it being

old residents. However, two other persons, to my knowledge, have here suffered with the complaint, both of whom recovered. One, Moses Judah (02), occupied and slept in the same store that Beers attended: and the other, George Burchell (01), resided in a house at the corner of this place and Front-street. They both had removed to this place this year, and Abel Beers (Judah's apprentice) had never spent a summer in New-York before.

Holmes, who died at the Hospital, took his complaint in Chesnut-street, the next door to the corner of Bancker-street. This same spot, at the junction of these two streets, is unpaved and sunken, and seems not only to solicit the accumulation of every thing worthless or unclean, but also to forbid the idea of any attempt to clean it out, lest it would make the pond the deeper. Indeed, so remarkable was this spot, as to make me, as early as the 7th month (July) last, request both of the Health Commissioners and the Alderman of the ward, to give some attention to it; as I considered it a place highly favourable to the promotion of Yellow Fever. However, it was not amended. Fortunately for the remaining inhabitants, they were a hardy set; most of them had undergone the fiery trial of 1795, in their families, and the remainder were old residents in town, as I have been informed, excepting one person, who lived the very next door to where this man was taken; but he luckily had been several months of the summer out of town, and did not return till some time after Holmes died.

The last person mentioned as having died of this complaint, resided in a healthy, cleanly part of the town: and how or where he could have taken his disease is still a mystery. Possibly he might have received it at some one of the sources above-mentioned.

These circumstances, being well considered and candidly examined, I think must clearly prove to every unprejudiced mind, that in this city there appears to be an intimate and inseparable connection between the prevalence of the Yellow Fever, and the existence of putrid effluvia: whether it be septon or hydrogene, or whatsoever other peculiar principle that is the active ingredient of their composition, is not my business at present to inquire into; nor shall I pretend to decide whether these effluvia alone are the sole or original cause of the complaint; or whether, merely like a smoaking hot combustible, it burns only after having received a spark from elsewhere. However, from some facts, particularly that from the Busbridge Indiaman, (Annals of Med. vol. I.) and others that might be brought if necessary, it seems highly probable, that such matters may, of themselves, sometimes burst out as it were, into actual flame at some point; from whence a general conflagration may spread through and involve the whole of these susceptible materials.

In 1795, from the inseparable connection observed to exist between this disease and putrid miasmata, I had strong suspicions of their being its sole cause; and, indeed, the evidence then adduced to the contrary, by the advocates of importation, being so weak and ungrounded, seemed rather to support the idea: however, from subsequent inquiry, and more minute information, in regard to some circumstances, not then so generally known, it now appears to me probable, that a foreign *fomites* might at first have excited our pestilential vapours into the action that spread such devastation in the most afflicted part of our city.

The brig Caroline arrived from Hispaniola on the 19th of 7th month (July), 1795, and hauled in at Dover-street wharf on the 20th; where, on that and the two following days, she discharged her cargo. She had lost one hand on her passage, his symptoms unknown. George A. Valentine, who attended the vessel after her arrival, was taken ill with the fever on the 25th of the same month, but recovered. On the same day, "four persons from "on board the ship William, from Liverpool, which arrived here "several weeks before, (all the hands having, previous to that day "and during the voyage, been perfectly healthy) were taken ill "with fever, attended with a yellow skin, hemorrhagies, vomiting "of black matter resembling coffee grounds, &c. and all died "within seven days." (Health Committee's Letter to the Governor.) It may be observed, that this ship and the Caroline lay at opposite sides of the same wharf, and that the people of both were employed on this wharf, at the same time, in unloading their cargoes.

On the same day also, "the owner of the ship Connecticut, "that had lately arrived from some part of England, and which "had drawn in at the next wharf, about the 20th or 21st of this "month, was seized with the fever, from which he recovered; "and about the same time, one of the mates, the steward, and two "of the hands, were seized in the same way, and all died." (Smith's Letter to Buel.)

Benjamin Paine, a custom-house officer, who was at that time attending the brig Active, which lay in the same slip, was likewise attacked on the 25th: he died on the 30th.

William Fitch's clerk, who was occupied in a store on the next wharf to where the Caroline lay, was taken on the 26th, and died a few days afterwards.

A. Jenkins, at the head of the wharf, was attacked on the 30th or 31st, and died. A few days afterwards, several of his family were taken sick, and the disease began to spread through the surrounding neighbourhood.

The circumstance of so many persons being taken on the same day, renders it highly probable, that some exciting cause of this

disease must have been introduced by the Caroline; since, had the contagion arisen from the pre-existing circumstances of the place alone, it is not likely that it would have shewn itself in so many instances at the same time. In that case, we should have looked for one to have been first taken, from whom a principle might be derived to stimulate the vapours of that noxious neighbourhood into their pestiferous operations. Had the disease, in these instances, originated solely from the surrounding filth, we should not have expected to find the men of the Connecticut, and those of the William, taken at the same time; since the former had drawn in there only *about* four or five days, whereas the latter had lain there for "several weeks" before they were taken sick.

In 1796, the brig Patty, Capt. Snow, from St. Bartholomews, arrived on the 28th of 6th month (June), and not July, as erroneously stated (probably by an accident of the press) in Dr. Bayley's Letter. (Medical Repository, No. I. Appendix.) This vessel drew in at Delafield's wharf; which is the next to the dock that was then filling up, and is adjoining the Exchange-slip; and although "*none of the crew had been sick of a malignant fever*," still she might have brought a *fomites* sufficient to set the putrid miasmata of such a place into a pestilential action. Jonathan Thompson, a shop-keeper, who lived No. 24 Moore-street, but a short distance from this dock, and upon which he was in the daily habit of taking his walk, became sick on the 4th of 7th month (July), and died on the 10th, with well marked symptoms of a highly malignant Yellow Fever. Capt. Neal's wife, who resided half way between the Exchange-slip and Moore-street, in Front-street, was seized on the 7th, and died on the 10th. Nathan Strong died on the 17th; from which time the disease became more and more general about the neighbourhood of the dock that was filling up, as stated in the letter just referred to.

The first person who died this year about the disemboguement of Roosevelt-street drain, if I am informed rightly, was James Callender (.1 on plate I.). He was a labouring man, who was employed somewhere towards the lower end of the town; and perhaps he was affected with the complaint from being about the Exchange; and transported, by his disease, the seeds of infection to that fertile neighbourhood in which he lived.

In 1797, the first person that was taken sick in East George-street, was W. Cummings: he arrived the 13th of 8th month (August), in the sloop Polly, from George-town, South-Carolina. One hand died on the passage, and Cummings was slightly indisposed at the time of his arrival, with what he supposed an ague and fever, but was not taken seriously unwell till two nights after he had lodged in this street. It may be, that a partial principle of death lurked in his system, during the whole time after the death of his

comrade, and most likely, never would have seriously acted upon him, had he not immersed himself in this or some such like fury-fostering miasmata. From him the disease seems to have spread. Two of his next door neighbours fell under its power, and it extended itself, as above related, through all the most offensive part of this street.

—— Kelly, of the brig Bellona, (which arrived the 3d of 9th month (September), from Savannah, with all her hands and passengers in good health) unfortunately pitched himself within the noxious effluvia of the Fly-market; and, still more certainly to fix his fate, lodged in a room, two of the windows of which opened towards the places where the putrid collections were gathered, and from whence the southerly winds must have brought their vapours immediately upon him. He is the first that appears to have had the disease in that neighbourhood; and perhaps the effluvia arising from his body, united with the putrid vapours emitted from the collections before noticed, spread the complaint around this little vicinity.

Another of the hands from the same vessel, took up his quarters at Chesnut-street; where he met with the necessary ingredients to bring his latent poison into life. He was afterwards taken to the New-York Hospital, where he died. It may seem somewhat strange, that the cause of disease that must have been kindled up at this spot did not affect any of his neighbours; probably, from circumstances already mentioned, they were proof against its operations.

The systems of the two persons who lived at or near Lynch and Stoughton's wharf, being richly loaded with the emissions from that offensive spot, might possibly have catched a spark of excitement in passing near the Market.

George Burchell may have taken his disease, after having been immersed in the effluvia from the inlet between Burling and Beekman slips, from the hands of the same vessel, as they frequented his shop immediately after their arrival. He probably set the whole materials in action, whence Beers and Judah were afterwards affected.

The other persons mentioned in the list of deaths, may have received the cause of their complaints at one or other of the aforementioned sources.

These circumstances render it probable that the cause of Yellow Fever, in the particular parts of our city, has, of late, been set in action by an enlivening spark from abroad. However, I do not consider it as decidedly determined. It is possible that Cummings, having suddenly changed from a purer air, with his already infirm body, to this hot-bed of putrefaction, may, from those predispositions, have had the disease created in him, before it had ripened

in the bodies of his neighbours; and he thence may have introduced the principles of his complaint to the surrounding air.

Just arrived from sea, and of a profligate habit, Kelly might thence have been a person, more than any other about the market, prepared for the deleterious operation of the putrid vapours in which they were enveloped; and thereby have been first affected by surrounding causes of fever; and, in turn, may have imparted a principle to the air, that usuriously repaid it for its fatal effects upon him.

And although James Callender worked towards the lower end of the town, there is no proof of his having brought his complaint, or even of his having been at Whitehall. Nor, indeed, is it certain that the Patty imparted any principle of disease to the poisonous vapours of that neighbourhood.

The Caroline, it is true, lay at Dover-street wharf for some days before the people thereabout became sick; and although such a number becoming suddenly sick, at the same time, and so soon after her arrival, render her very justly suspected, still it is possible, that, from the particular and similar predisposition of most of them, only one having been an old resident, and, all excepting three, having lately come from the same place, and having been alike accustomed to the same habits of diet, exercise, &c. they may have had the complaint generated and arrived to maturity in them all at the same time. From which beginning, the disease might have been communicated to the whole of that peculiarly filthy part of our city, in 1795, without the necessity of believing that the Caroline brought any deleterious principle from Hispaniola. Although the circumstance of some of these people having lain at that place a much longer time than the others, and others again having continued there during the whole summer, shew, beyond a doubt, that some cause of the complaint must have *began* to operate after the 20th of the month, still this does not necessarily devolve upon the Caroline: perhaps some particular change in the air,* or some other peculiarity might have occurred, just at that time, to have given the putrid miasm its rankest perfection.

Whether the complaint is ever generated by putrefaction *alone* or not, still I am rather inclined to believe, that, *generally*, in our city, it has been set in action by an *assisting* cause from abroad. For, did simple putrefaction of itself give rise to this complaint among us, we should expect to find more or less of it, in that row of tenements called Moore's buildings, in the years of 1796 and 1797. For although those buildings are set upon high

* It must, however, be acknowledged, that no particular change was evident in the *temperature* of the air. (See the Meteorological Observations in my account of the Epidemic of 1795).

ground, still they are upon a perfect level, and are the most crowded with, perhaps, the most dirty set of residents of any in the city; and these chiefly newly arrived Irish people. Still I cannot learn that a single case of Yellow Fever has been there for these two years past. And, I can hardly believe, that if a person with that complaint had been introduced among them about six weeks ago, but that he would have spread mortality around him.

In East George-street also, during the last year, we should have expected to find, at least, a few cases of the complaint; yet I cannot, notwithstanding the most diligent inquiry, find a single instance. Had a single instance occurred, probably it would have caused a general prevalence there.*

In addition to this, it may be observed, that the singular filthiness that has existed in different parts of our city, and particularly about some of the slips, towards the lower part of the town, for several years before 1791, was not attended with any material injury to the health of those in its vicinity; at least, we have no account of the Yellow Fever's spreading around them.

In the years 1792 and 1793, the mud machine was employed in clearing out the docks, the same as in the preceding and the succeeding years. But we heard of no Yellow Fever being the consequence.

But that the simple emanations from a person under the Yellow Fever, without the joint action of putrid miasmata, *will not* produce a like disease in another person is very clear, not only from the many facts heretofore adduced in the accounts of that disease, as it appeared in 1795, (see Webster's Collection of Papers) but also from the confirming occurrences that have happened this year. The person supposed to have enkindled the disease in East George-street, as well as the one at the Market, were both conveyed to, and died at Bedlow's Island; yet none of the boatmen that took them there, nor any of the attendants, nurses, or those confined in the Lazaretto with other complaints, suffered any indisposition from them. A person, as I am informed, who took his complaint

* I am aware of an objection that may be made to this idea, in accounting for the healthinefs of this ftreet it 1796; firft, that the preceding year's depopulation, and the dreadful character that the ftreet fuftained thereby, probably prevented it from being fo crowded as before and fince; and, fecondly, that the ftreet having been filled up during that fummer might prevent fo great an accumulation of filth. In anfwer to this it may be remarked, that notwithftanding the character of the ftreet, it had not been obfervably more thinly inhabited; and although the ftreet was filled up that year, yet that was done in the fore part of the fummer, and fome time before the fickly feafon, and that the yards were equally unfavourably fituated as before or fince; and that although the filling up of the ftreet might have had its ufe, ftill we can hardly believe fuch a partial bufinefs would have produced fuch an intire exemption from this difeafe, had filthinefs been its fole caufe.

at Philadelphia, was also carried to the Island, and was there attended by his friends, who had come directly from the fresh free air of the country, and with as little inconvenience. Two of the patients afore-mentioned died at the New-York Hospital, one from the market, and the other from Chesnut-street; yet they communicated the disease to no one there. Parsells, who died in Cedar-street, infected no one in that neighbourhood. Nor did Suydam spread any disease around the Exchange where he died; and Havens' complaint terminated with his existence, in the upper part of Roosevelt-street.

To the foregoing circumstances may be added, that about the same time that Kelly and Holmes (the former of whom is supposed to have introduced the disease about the market) arrived from Savannah, there also were several other arrivals from the same place, none of whose hands, or passengers, as far as I can learn, suffered with a like disease;* probably from their having taken more eligible lodgings.

The simple result of the foregoing facts and observations appears to be,

I. That the general cause of the Yellow Fever, as it has appeared in this city, is what chemists call a *tertium quid*, neither one thing nor the other, but a result of the junction of certain matters emited from a human body, labouring under such a disease, with the effluvia arising from animal and vegetable substances in a state of putrefaction.

II. That putrid effluvia may possibly, of themselves, generate the disease in persons highly predisposed, and from whom, by their assistance, the fatal epidemic may be spread through a neighbourhood.

III. That most probably, the spark that has kindled up the putrid vapours, in certain parts of our city, into action, was originally introduced from other places. And,

IV. As I have uniformly believed, and repeatedly expressed, "*that no Yellow Fever can* SPREAD, *but by the influence of putrid* "*effluvia.*" (Account of the Epidemic Yellow Fever of 1795.)

Hence then, the grand, the much agitated "question of im-"portation or non-importation, as it respects the health of a place," to use the words of Dr. Smith, "sinks into its merited insignifi-

*This, perhaps, by some, may be thought inaccurate, as one of the hands of the Shepherdess died soon after her arrival here, and, as was currently reported, of the Yellow Fever; but, from inquiry, I do not find that his indisposition exhibited any marks of that disease. He did not vomit at all, at least after he was on shore; nor was he in any wise yellow; he being, when dead, according to the expressions of his wife, "as fair a corpse as any in the world."

" cance; the efficient cause, the *causa sine qua non*, being clearly dis-
" cerned as depending on local circumstances." (Letters to Buel.)

To depend, therefore, for our safety from Yellow Fever, upon the rigours of our port laws, or the vigilance of our Health Officers, while these pools of putrefaction are suffered to remain, is like building a city with cedar and pine, and confiding in the *watch* to secure us from fire. But if these pregnant sources of destruction are dried up, we may, like those who case the wooden work of their brick-built, tile-roofed houses, with iron, rest at ease in our habitations, equally secure against the deceitful captain's intrusions, or the incautious sailor's blundering into our ports, in the one case, as, in the other, we should be of the vile incendiary's match or the careless neighbour's spark. As the latter would die in their own combustion, so the former would end in the fate of the single sufferers.

To rest our security from the Yellow Fever (should it finally appear that it is always imported) *solely* upon the slight precaution of making such vessels, from the West-Indies and Southern States, as may have, or may have had persons with that complaint on board them, do ten days or two weeks quarantine, must certainly be a very venturesome business. The Patty had not had any of her crew sick with a malignant fever. The people of the Bellona were in good health from their leaving Savannah, till some days after they were in this city. And the Polly might have done the usual quarantine, without any security to us, as Cummings was not seized with his disease till seventeen days after his arrival.

Nothing less than completely prohibiting all commercial intercourse from the Southern States and the West-Indies, during the summer and first fall months, or (what would, in the end, amount to the same thing) making every vessel from thence do full quarantine, and have their cargoes unloaded and properly unpacked and ventilated, before they are permitted to come into our city, can ensure us against the introduction of a cause of the Yellow Fever: however, these severe restrictions may be superceded by merely having ourselves properly prepared. If we only keep decently cleanly, it will be perfectly indifferent to us, whether a Carolinaman or a West-Indian should die with Yellow Fever in our city or in our harbour, since, then, we should be guarded against any ill effects from them.

New-York, 10*th Month*, 1797.

ARTICLE III.

A SINGULAR CASE OF DIFFICULT PARTURITION SUCCESSFULLY TREATED.

By Dr. THOMAS ARCHER, *of Harford-Town, Maryland.*

[*Communicated in a Letter, dated September* 22, 1797, *to his Brother, Dr.* ROBERT H. ARCHER, *of Baltimore; and by him tranſmitted for inſertion in the Medical Repoſitory.*]

ON the morning of the 9th of May last, I was requested to visit a servant woman of Mrs. E——s, who had been in labour four days. On examination with my hand to know the situation of the child, I was surprised to find that the os uteri was not dilated to more than the size of a cent. It formed a thick, rigid, cartilaginous-like ring, not yielding, nor becoming softened by the pain. The midwife in attendance informed me, that the patient was in her 30th year; that at her 15th year, she had a prolapsus uteri, which was reduced after it was washed in a strong decoction of white-oak bark and dusted with powdered resin; that this was her first child; that her pains had been considerably forcing; but the intervals between them long; and that the waters had been gradually discharging for two days. From this statement of her situation, I did not doubt but her labour would be lingering. Her constitution was robust and strong. Her pulse was evidently marked with symptoms of tension, or convulsive action. I let blood to 18 ounces, directed gentle laxatives, with emollient glysters to be administered occasionally; oleaginous injections into the vagina and the vapours of hot water were advised, as means for relaxing the os tincæ. She took a dose of opium and stramonium to procure rest, and remove unprofitable pains. I now left her to the care of the attending midwife, till the following day in the evening.

10th. At this time there was no perceptible alteration in the dilatation of the os uteri. The child's head could now with difficulty be felt through the os uteri, which was advancing with every pain, without dilating in the least. A few pains protruded the uterus, with its contents, without the os externum! The child was now evidently dead, which, from several well marked circumstances, had taken place about two days previous to the present period. I dreaded the event of a case so new and alarming, and informed her mistress there was scarcely a chance for her life; that it was possible to deliver her, but the consequence of the

operation might be fatal to her. The distance of a physician rendered it impossible to call a consultation. Death appeared as the closing scene of every plan I proposed; in fact, her situation required such immediate assistance, that there was scarcely a moment for deliberation. To leave a mass within the uterus, which was hourly becoming more offensive, and to be an idle spectator of the fatal event that must ensue, was depriving her even of the chance which a doubtful and desperate remedy afforded.

I recollected having read several well attested cases, where the uterus was lacerated by its violent contractions round the body of the child in parturition. The child was squeezed partly through the aperture into the abdomen; it was, however, delivered, and the lacerated uterus healed without any difficulty or even the occurrence of an uncommon symptom. The favourable event of these extraordinary cases, determined me to hazard an artificial division of the neck of the uterus, (which appeared to be less dangerous than a laceration) to make room for the delivery of the child. Unknown to her or any of the attendants, except the midwife, who held the candle (for it was now night), with a common spear-pointed lancet, I made three incisions in the neck of the womb, which was very much distended; each about two inches in length, viz. one from the uterus leading towards the urethra; one towards the perinæum; and the other towards the left labia. The pains at this time were not strong, yet they were sufficient to expel the child. After the incisions were made, the delivery was almost instantaneous. The umbilical cord was wrapped round the body, arm, and neck of the child. The incisions produced no pain, neither was there any hæmorrhage followed the lancet. The uterus, after the separation of the secundines, which came away without difficulty, contracted and returned with but little assistance to its pristine situation. She was now put to bed and desired to be kept quiet. I directed anodynes to be given occasionally, and glysters to be administered so as to procure one or two dejections daily. Neither soreness, pain, nor fever followed this practice more than would have happened in any easy natural labour! The lochial discharges were very inconsiderable, and not at all offensive. She was up and walking about her room in three weeks after her delivery, and is now in perfect health.

ARTICLE IV.

Some ACCOUNT *of a* DISEASE *among* CATTLE, *which has prevailed in a part of Connecticut.*

In a Letter to Dr. MITCHILL, *from the Rev.* ELIJAH PARSONS, *dated East-Haddam, October* 17, 1797.

SINCE my return from New-York, I have made particular inquiry of several intelligent farmers, concerning the disease which has, for ten or twelve years past, been so destructive to horned cattle in this vicinity, and now attempt to answer the questions which you condescended to propose.

Concerning the *mineral productions of the soil*, nothing peculiar can be observed. We have here no fossil bodies except stones, which are dug for the purpose of fencing inclosures. The soil is generally stony, and the country hilly, better adapted for grazing than for tillage.

There has been no suspicion of any *poisonous quality in the dew* adhering to the herbage. The thought is new; it has struck no one's mind, nor has it been imagined, that *poisonous plants* have caused the disease.

It has *rarely* destroyed cattle so *old as three years*. In some instances, however, it has been mortal to cows, but never, it seems, to oxen. It has been most fatal to calves in autumn, and to yearlings in May and June. Some have died even in winter. The stock in point of quality, most liable to the ravages of this distemper, are the largest, most thrifty, and highest fleshed.

The symptoms of the *mortification* (for this is the vulgar name of the disease) are these:—The infected creature is found listless, unwilling to move, and commonly lying down, which an hour before was feeding, and to appearance well. A small spot, which may be covered with a man's hand, is found swollen, and soft in the leg, shoulder, flank, side, but more often in the back, in the region of the kidneys. In the course of six, twelve, or twenty-four hours, life terminates with little expression of pain.

I can give you no information of the *appearance of the intestinal canal*, for no carcase has been dissected. The stench immediately after death is intolerable. The very hide is often left to rot with the carcase. Upon skinning, the swollen spot is found to contain a jelly and black blood. A tanner has informed me, that " the hide which covered the mortified spot is often rotten;

"and that he has a number every year, which, after dressing, "have a hole of the same dimensions with the swelling."

The cause of the disease assigned by our most discerning farmers is a plethory; for it proves destructive to cattle after a change of pasture, or fodder, from bad to good. Many calves in years past, have died after feeding in the fields of grain, or in rowing in the fall of the year. This is a circumstance of which I was ignorant when I saw you.

Accordingly—*the remedies* which have been applied are chiefly of the preventative kind; such as bleeding, on a change of pasture of a better quality, and care not to permit a sudden change, from bare feed to full bite. After the appearance of the disease, many remedies were at first applied, but not one to any purpose; all remedies have been supposed to be totally ineffectual. One person, however, has imagined that he has effected a cure, *in two or three instances*, when the disease was taken in its first symptoms. After copious bleeding in the neck, he informed me, that he gave the animal his own blood to drink, which operated cathartically, and then made an incision in the swollen spot, took out the jelly and gore, filled the cavity with rum and salt; after which the recovery was gradual. In all other instances, which were not numerous, he informed me, that this remedy had done neither good nor hurt.

Thus, Sir, in the best manner I was able, I have returned an answer to your questions, relative to the pestilence which has destroyed a multitude of cattle.

If the publications you may by this time have received from your learned correspondent in Germany, contain any observations or remarks that may be beneficial in preventing or counteracting this great evil, you will oblige many in this quarter by communicating them, as all the precautions which have been used, are not sufficient to put a stop to its ravages. May your philosophical researches continue to be beneficial to your country, as they are honourable to the American name. I am, Sir, with esteem, respect, and a sense of obligation for your politeness, your humble servant,

ELIJAH PARSONS.

ARTICLE V.

A Case of CANINE MADNESS, *which terminated fatally, at Suffield, in Connecticut, on the 11th of November*, 1797.

Communicated for the Medical Repository, in a Letter, (dated Suffield, Nov. 18, 1797*) to Dr.* MITCHILL, *from Dr.* ALEXANDER KING.

DR. KING remarks, in the letter above referred to, that this is the first instance of hydrophobia which has fallen under his observation, in a practice of nearly forty years; that most of the symptoms bear a great affinity to the tetanus, some instances of which he has seen; that the symptom denominated *retching* by him, is, according to his belief, peculiar to the rabies canina; and that though he was not called to the boy when first wounded, yet he attended him from the appearance of the hydrophobic symptoms, with particular assiduity. The publishers of the Repository have thought it but doing justice to Dr. King, to insert these observations, as they may have some influence in elucidating a connection, which has long been suspected, between hydrophobia and tetanus, and as they demonstrate the fidelity of the author.

" On Saturday the 28th of October, 1797, James Remington, a lad of about six years of age, was on a visit at a friend's. When he first came to the house, he took notice that the dog which belonged to the family, growled at him, and threatened to bite him; which circumstance he mentioned to some of the people. He escaped for that time without any injury; but soon after, this lad, with a number of other boys, was at play in the street, at some distance from the house, and the same dog had followed the boys of the family to that place, and there fell upon James, and bit him in the face. The other boys beat him off, and he ran home. This adventure put an end to their diversion; and this lad, with the other boys in company, returned to the house, with his face wounded and bleeding. When they approached near the house, they observed the dog sitting by the gate. As James came up, he flew at him again with great fury, threw him down, and wounded his face in a desperate manner. One of his tusks entered the lids of his right eye, and rent them both asunder. Another perforated the cheek on the left side, and forced out two of his teeth, and lacerated his face in various other parts. In this mangled condition he was conveyed into the house, and assistance immediately

called in for his relief. After washing off the blood, and examining the wounds, the lacerated eye-lids were properly united by a suture on each lid, and the wounds dressed in the usual manner.

"A considerable degree of inflammation succeeded; and in the space of about 48 hours, both eyes were intirely closed by the swelling, and he continued perfectly blind for some days. After the inflammation had subsided, a good digestion and pretty free discharge came on, which were encouraged by stimulating digestives; in order, if possible, to prevent the effects of infection, in case the dog had been mad; which was apprehended by many people; the accident having excited a general alarm in the neighbourhood, particularly in the family, and among the friends of the wounded lad. No pains were spared to obtain the best advice, as to the mode of treatment proper to be adopted, in case of infection. He was put on a mercurial course of medicine; and the ung. cœrul. frequently applied to the parts affected. As the inflammation went off, he soon recovered his appetite, and with that his cheerfulness and activity, and appeared to be in a favourable state of recovery.

"But on Tuesday, the 10th day after he was wounded, towards evening, his friends observed that he began to droop, and did not appear so cheerful and active as usual. In the night following, he was rather restless and disturbed in his sleep, and appeared not to rest so quietly as he had done before.

"Wednesday (11th day) morning, on removing the dressings, the wounds were dry without any discharge, notwithstanding the plentiful discharge which appeared on the dressings the preceding morning. He complained of some pain in the wounded eye, and in his head; appeared to be rather dull and listless, with a slight fever, and other symptoms usually attending an incipient cold; and it was hoped that his complaint originated from that source only. In the afternoon of the same day, however, his attendants observed, as he attempted to drink, that he was attacked with starting and twitching, particularly in his neck, which drew his head back. On being asked why he did so, he replied it would do so, he could not help it. This symptom alarmed the family, and they immediately called in his attending physician, who observed that he was frequently attacked with sharp darting pains through his head and breast, attended with spasms; particularly when he attempted to drink. He therefore concluded, that these were the precursory symptoms of approaching hydrophobia. The night following he was very restless and uneasy; slept but little, and that only in short disturbed naps; frequently starting up in a fright. These symptoms increased during the course of the night.

"On Thursday (12th day) morning, all the complaints before enumerated had increased to an alarming height. He inclined to

lie on the bed, and chose not to be moved; his countenance was pale, attended with momentary flushes in the cheeks; and he appeared in a state of general debility, while, at the same time, the nervous system seemed to be excited to the highest state of sensibility. Fearfulness, anxiety, and anguish, were particularly apparent in his countenance. And, indeed, fearful apprehensions seemed to be a predominant symptom, not only at this period, but through the subsequent stages of the disease. His respiration was difficult and laborious, especially in the return of the paroxysms; which had now become frequent and distressing. At each inspiration, spasmodic catches, resembling quick and short sighs, interrupted his breath. When he attempted to drink, he was seized with violent spasms, particularly in his neck, which drew his head back with great force, notwithstanding his utmost efforts to avoid it. Barely mentioning drink to him would produce sensible agitations, and hasten the return of the paroxysm. He was able to swallow a tea-spoonful at a time, and that with great difficulty, which he would seize with eagerness, trembling and agitation. He appeared to have the same dread and aversion to the wet cloths which were used in fomenting his stomach, as to drink; and renewing them produced nearly the same effect. At short intervals of ten or fifteen minutes, he was seized with violent retching, consisting of one effort only at a time. This symptom was singular, and what I never before had noticed in any disease, (this being the first instance of the disorder within my knowledge). The noise produced by this effort was sharp and shrill, different from what is usual in retchings occasioned by sickness at stomach, and appeared to be the effects of violent spasms without sickness, as he never discharged any thing from the stomach, except a little wind. But this exertion seemed to afford a momentary respite to his anxiety and distress; and he said he felt better after it.

"This symptom bore some kind of resemblance to the singultus, but rather more like a retching to vomit; and attended him at different intervals, as the spasms were more or less violent, through the course of the disease. He would frequently shriek out in great agony, from the acute darting pains in his head and breast. These shrieks resembled those of infants in spasmodic paroxysms, occasioned by worms, &c. commonly called convulsion fits, and appeared to be the effect of fearful apprehensions, as well as of pain. At this stage of the disorder, he often complained of the cold, attended with frequent rigors. He retained the exercise of his reason; unless fearfulness might be supposed to indicate some sort of derangement in the mental faculties. His eye which had not been wounded, appeared a little red and inflamed. The pulsations of the artery were about one hundred in a minute.

"At this stage of the disease, by advice of several physicians who were present, he was put on the use of opium and musk, in large and repeated doses, particularly of the former; and the attendants were directed to keep the room filled with the fumes of vinegar. About three hours after taking the first dose of thebaic extract, the spasms in respiration were rather less frequent, and not quite so hard; the other symptoms continued in nearly the same state.

"In the evening, the pulsations were about one hundred and ten in a minute. He complained of a disury, and attempted frequently to make water without effect. He inclined rather to be up, than in bed. The catching in respiration was, in some measure, abated. The turns of shrieking were rather more frequent, attended with violent agitations, and some degree of deliriunr; particularly during the continuance of the paroxysms. In the course of the night the disury abated; but, whenever he attempted to drink, he was unable to retain his urine, and would call for the pot when they offered him drink, or even mentioned it in his hearing. This symptom likewise continued through the remaining progress of the disease. He could now swallow with less pain and agitation than before. He passed this night without any sleep or rest. About midnight, the pulsations were one hundred and twenty in a minute.

"On Friday (13th day) morning, there was a sensible variation in the symptoms. The pulsations had decreased to ninety in a minute, with frequent intermissions. He refused altogether to lie on the bed; but chose to continue in an erect posture. He appeared extremely wild, in great hurry and agitation, constantly in motion, and continually talking. The catching in respiration, had, in a great measure, subsided; but the virulent retching still continued. He could take liquors with less terror and agitation. About this time he began to complain that his throat was full, and felt sore. At evening a hoarseness came on. The pulsations had fallen to about eighty-five in a minute, with frequent intermissions, and were now become exceeding weak and feeble. A coldness of the extremities had been perceptible some time before, but was now very apparent. He vomited in the evening, which seemed to afford a momentary relief. He vomited again in the course of the night. The matter discharged from the stomach was no way discoloured.

"He had taken about sixteen grains of thebaic extract, in the space of twenty-four hours, from Thursday morning to this time; which had, in some measure, moderated the violence of the spasms, but had not subdued the virulence of the disease.

"Fearful apprehensions, which had been constant through the various stages of the disorder, now assumed the most formidable

aspect, and threatened a speedy dissolution. Foaming at the mouth, grating of his teeth, and, by turns, raving distraction, succeeded the other symptoms, and were among the last, in this sad catalogue of complaints, which, before morning, put an end to his life and suffering together, and brought relief to the sympathizing spectators.

REVIEW.

ART. I. *Medical Inquiries and Observations:* Containing an Account, &c. By *Benjamin Rush*, M. D. &c. &c.

[*Continued from page* 217, *and concluded.*]

HAVING taken a hasty survey of the two former, we now proceed to the third and last part of the volume before us, viz. "A defence of blood-letting as a remedy for certain diseases."

As introductory to the defence of blood-letting in fevers, Dr. Rush delivers a general view of all the usual remedies for fever, in its ordinary state; which prepares the way for comparative observations upon each of those set down under the head of evacuants.

In the inflammatory state of fever, our author supposes blood-letting to be indicated by the mode and circumstances of attack, as well as by the robust habits of such as are chiefly subjected to this form of disease—by the proximate cause of fever, depending, as he thinks, on morbid and excessive action in the blood-vessels—by the symptoms of the early stage, such as sleepiness, and an oppressed pulse, delirium, with a throbbing pulse and great pains over the body—by the rupture of the blood-vessels, arising from the quantity or impetus of the blood—by the relief obtained from remedies of less efficacy, which act indirectly in reducing the force of the sanguiferous system—and by the great advantages which have attended blood-letting in this state of fever, when used seasonably and in due quantity.

Some of these advantages are enumerated by the author, as follow—blood-letting frequently strangles fever, when used in its forming state—it imparts strength to the body, by removing the pressure of indirect debility, and thereby obviating a disposition to faint—it reduces the uncommon frequency of the pulse—it renders the pulse more frequent, when preternaturally slow—it checks the nausea and vomiting which attend the malignant state of fever—it renders the bowels, when costive, more easily moved by purging physic—it facilitates the action of mercury in exciting a salivation—it disposes the body to sweat spontaneously, or renders the operation of diaphoretic medicines more effectual—it *suddenly* removes a dryness, and *gradually* a blackness from the tongue—it removes or lessens pain in every part of the body, and more especially in the head—it removes or lessens the burning

heat of the skin, and of the stomach—it removes a constant chilliness, not readily yielding to other remedies—it checks profuse, partial, or unprofitable sweats, rendering them moderate, universal, and salutary—it sometimes checks diarrhœa and tenesmus more effectually than astringent medicines—it suddenly relieves the intolerance of light, which accompanies many of the inflammatory states of fever—it removes coma—it removes sleep—it prevents effusions of serum and blood—it prevents the chronic diseases of cough, consumption, jaundice, abscess in the liver, and all the different states of dropsy, which so often follow autumnal fevers—it prevents the termination of the inflammatory in the gangrenous and chronic states of fevers—it relieves fever, without allowing it to assume those alarming symptoms which excite constant apprehensions of danger and death—it prepares the way for the successful use of the bark and other tonic remedies—and, finally, it tends to prevent relapses.

Notwithstanding the numerous advantages of blood-letting, there have been, Dr. Rush observes, many objections to it; these he enumerates, and endeavours to refute in the following order, viz. warm weather—being born and having lived in a warm climate—great apparent weakness—infancy and childhood—old age—period of menstruation—pregnancy—fainting after bleeding—coldness of the extremities, and of the whole body—sweating—dissolved blood—an undue proportion of serum to crassamentum in the blood—the presence of petechiæ on the skin—the long duration of fever—tremors and slight convulsions in the limbs—the periods of pleurisy beyond the fifth or seventh days—appearances of being worse, after a first or second bleeding—the apprehension of bringing on a nervous, or the chronic state of fever—the debilitating effects of bleeding—the opinion that bleeding renders the habitual use of it necessary to health and life—the opinion that bleeding, more especially where it is copious, predisposes to effusions of serum in the lungs, chest, bowels, limbs, and brain—and, lastly, the persuasion that other evacuating remedies are more safe, and equally effectual in reducing the inflammatory state of fever.

These objections are all limited, explained, or combated, by Dr. Rush, with great force of argument and authority. He recites many cases, of an impressive kind, which strongly confirm his doctrine on this subject. We are sorry the extensive and detailed manner of his reasoning will not permit us to follow him.

Our author proceeds, in the next place, to examine, in detail, those evacuating remedies which have been proposed as substitutes for blood-letting. They are vomits—purges—sudorifics—salivation and blisters.

Although these remedies are admitted by the author, to be powerful and effectual in many cases of fever, he cannot allow

them to take place of blood-letting; and he justifies this opinion, by stating the uncertainty, inadequacy and slowness of their operation in urgent cases; that several of them are unsafe and inapplicable in many important instances; that they are not, like blood-letting, subject to the controul of a physician, but often operate more or less than was intended by him, or indicated by the disease.

Blood-letting, on the contrary, our author contends, possesses great advantages over every other mode of depleting, inasmuch as it abstracts one of the exciting causes, viz. the stimulus of the blood from the seat of fever—as it is quick in its operation, and may be accommodated to the rapidity of fever, when it manifests itself in apoplexy, palsy and syncope—as it is intirely under the command of the physician—as it may be performed with the least attendance of nurses or friends—as it disturbs the system much less than any of the other modes of depleting—as it is a more delicate remedy than most of the others—as it produces no immediate danger to life—as it is less weakening, when used to the necessary extent, than the same degrees of vomiting, purging, and sweating—and as it produces a more rapid and perfect convalescence.

But, by the use of blood-letting in fevers, we are not, Dr. Rush observes, precluded from the benefit of the other evacuating remedies. And there are cases, in which the combined or successive application of them all, is barely sufficient to save life.

Having replied to the principal objections to blood-letting, and stated its comparative advantages over other modes of depletion, the author next proceeds to mention the circumstances which should regulate the use of it. These are,

1. The state of the pulse.

The following states of the pulse indicate the necessity of bleeding—a full, frequent, and tense pulse, such as occurs in the pulmonary, rheumatic, gouty, phrenitic, and maniacal states of fever—a full, frequent, and jerking pulse, without tension, such as occurs in the vertiginous, paralytic, apoplectic, and hydropic states of fever—a small, frequent, but tense pulse, such as occurs in the chronic pulmonary and rheumatic states of fever—a tense and *quick* pulse, without much preternatural frequency, such as is common in the Yellow Fever—a slow but tense pulse, such as occurs in the apoplectic, hydrocephalic, and malignant states of fever, in which its strokes are from 60 to 90 in a minute—an uncommonly frequent pulse, without much tension, beating from 120 to 170 or 180 strokes in a minute, occurring likewise in the malignant states of fever—a soft pulse, without much frequency or fulness, to be found in affections of the brain, and in peripneumonia notha—an intermitting pulse—a depressed pulse—and an imperceptible pulse.—The slow, intermitting, depressed, and imperceptible states of the pulse may not only arise from congestion

in the brain, but from great excess of stimulus acting upon the heart and arteries. The slow, uncommonly frequent, intermitting, and imperceptible states of the pulse, which require bleeding, may be distinguished from the same states of the pulse, which arise from direct debility, or an exhausted state of the system, and that forbid bleeding, by the following marks:—They appear in the beginning of a fever—they occur in the paroxysms of fevers, which have remissions and exacerbations—they sometimes occur during the whole course of an inflammation of the stomach and bowels—and they occur in relapses, after the crisis of a fever.

The other states of the pulse indicate bleeding in every stage of fever, and in every condition of the system.

2. Regard should be had to the character of the reigning epidemic, in deciding upon blood-letting.

3. The constitution of the patient, and his habits of blood-letting, should be considered.

4. Respect should be had to the country or place from which the patient has lately arrived.

5. The appearance of the blood, after bleeding, should be attended to, in order to judge of the propriety of repeating it. The author then describes these appearances, and arranges them in the order in which they indicate different degrees of inflammatory diathesis, beginning with the highest. These are, 1. Dissolved blood. 2. Blood of a scarlet colour, without any separation into crassamentum or serum. 3. Blood in which part of the crassamentum is dissolved in the serum, forming a resemblance to the *lotura carnium*. 4. Crassamentum sinking to the bottom of a bowl in yellow serum. 5. Crassamentum floating in serum, at first turbid, afterwards becoming yellow and transparent by depositing certain red and fiery particles. 6. Sizy blood, or such as is covered with a buffy coat.—But it should be recollected, that all these appearances may be varied by the circumstances of blood-letting.

6. Blood-letting should always be copious, when there is danger from congestion or inflammation, in *vital* parts.

7. What quantity of blood, our author inquires, may be safely taken in an inflammatory fever? Supposing a person of ordinary size, to contain between 25 and 28 pounds of blood, and that much more blood may be taken in the febrile than in the healthy state of the blood-vessels, it is suggested that, perhaps, some cases of fever may be found in which four or five pounds of blood may be sufficient to keep up an equal and vigorous circulation. In confirmation of his opinions on this subject, Dr. Rush mentions a number of very striking cases of the quantity of blood which has been drawn by design, or lost by accident. He produces also some surprising instances of the rapid regeneration of blood, when drawn or lost.

In short, our author contends, that bleeding should be repeated, while the symptoms first requiring it continue, even until four-fifths of the blood in the body be drawn away. He adds, that in malignant fevers, he has always observed the cure to be most complete, and the convalescence most rapid, when bleeding has been continued until a *paleness* is induced in the face, and the patient is able to sit up without being fainty.

8. In bleeding, the quantity at each time should be large or small, according to the state of the system. Where the pulse acts with force and freedom, from 10 to 20 ounces may be taken at once; but in cases of great indirect debility, where the pulse is depressed, it will be better to take but a few ounces at a time, and to repeat it three or four times a day.

9. Arteriotomy would, probably, have many advantages over venesection, could it be performed at all times, with care and safety.

10. Our author supposes, that bleeding from the arm may supersede any other mode, in nearly all cases, except when local blood-letting may be necessary.

11. As to the proper time of bleeding, our author supposes it may be used at all times, when indicated by the pulse and other circumstances, in continual fevers; but it should be used chiefly in the paroxysms of such as intermit.

Dr. Rush concludes his defence of blood-letting, by some observations on its usefulness at the period when the menses cease to flow—in diminishing the pain and slowness of parturition—on the probability of its advantages, if used with sufficient energy, in cases of hydrophobia—on its beneficial effects in the reduction of dislocations, which resist the ordinary means—and its efficacy in preventing palsy, apoplexy, cough, colic, and some of the other diseases more particularly incidental to old age.

It would be doing great injustice to the author, to omit an acknowledgment of the distinguished merits of this last part of his work. He treats a subject of the highest practical concern, important, difficult, and interesting, from a variety of considerations; and, we must add, that, in our judgment, he treats it with perspicuity, precision, and great ability.

We conceive the author has perfectly succeeded in establishing the following positions—that blood-letting is a remedy of indispensible importance, in malignant and pestilential, as well as in many other kinds of fever—that much of the reasoning employed against it, is inconclusive and fallacious—and that, in the general treatment of fevers, it is not liable to produce effects so hazardous and detrimental as common opinion has usually imagined.

From this declaration, it will not be understood, that we are insensible of the mischief that may result from an indiscriminate and excessive employment of blood-letting, or from a hasty and mis-

taken application of the author's principles. If any remedy can be pronounced powerful, decisive, and irrevocable in the changes produced by it in the animal system, it is assuredly this. It would be fortunate for mankind, if a remedy of such extensive and frequent application, and of so much efficacy, could always be administered under the direction of a discrete and sound judgment. Every person must deprecate the pernicious mistakes, which ignorance, inexperience, and temerity may commit in this subject. And, if it had been possible for the author to subjoin restrictions and cautions still more clear and definite than those he delivers, we should have rejoiced to see them.

In addition to what we have more than once suggested in the course of this review, it will be proper here to offer a more explicit apology for the cursory notice we have been compelled, by the limits prescribed to us, to take of several important parts of this work. Many passages, containing reasonings of the greatest consequence to the author's opinion, admit neither analysis nor abridgment; and such passages we have often, unwillingly, been obliged to pass over. We hope we have not mistated the author's meaning in any instance; but if this should have happened, through inadvertence, we rely on his liberality to excuse it.

We take leave, with respect, of a performance, from the perusal of which we have derived so much instruction and pleasure; and shall be happy to renew our attention to the observations concerning gout, and the diseases of the mind, which the author promises to lay before the public at some future period.

ART. II. *Two Lectures on Combustion: supplementary to a Course of Lectures on Chemistry, read at Nassau-Hall; containing an Examination of Dr. Priestley's Considerations on the Doctrine of Phlogiston, and the Decomposition of Water.* By *John Maclean*, Professor of Mathematics and Natural Philosophy in the College of New-Jersey. Philadelphia. *Dobson.* 1797. 8vo. pp. 71.

THE performance before us affords another agreeable instance of the progress of chemical discussion in the United States. We feel much satisfaction in announcing to our readers each new proof of the growing taste in America, for this kind of inquiry. Professor Maclean appears to have meditated a reply to Dr. Priestley, before he knew that Mr. Adet was engaged in a similar undertaking; and that his examination of the subject might be as effectual as possible, he seems to have explained, to the students of Princeton College, in his lectures, part of the substance of the pamphlet under consideration, before he offered it to the public.

Mr. Maclean, in his answer, follows the arrangement of Dr. Priestley in his publication, with which, we presume, our readers are sufficiently acquainted, from the account given of it in the second number of this volume. From the examination of the first chapter of Dr. Priestley's work, on the Constitution of Metals, our author comes to the following conclusions: to wit. 1. That turbeth mineral may be reduced to running quicksilver, by heat alone, without addition. 2. That quicksilver, revived from its calces in inflammable air, does not differ at all from that recovered by increase of temperature only. 3. Though hot iron may so affect the air as to be smelled, this is no evidence of the separation of phlogiston from it. 4. Azotic air cannot be formed from the union of oxygene, with any matter which hot iron emits. 5. When iron is dissolved in the acid of brimstone, it is reduced to a state resembling that of the black oxyd. 6. That inflammable air and other combustible substances, are instrumental in reducing metallic oxyds by the attraction exerted for their oxygene. And, lastly, That the inflammable air, obtained from water and hot iron, and from iron and sulphuric acid, proceeds not from the iron, (nor, we may add, from the acid itself) but from the decomposition of the water.

Mr. Maclean next examines Dr. Priestley's second chapter, on the Composition and Decomposition of Water; and sums up his inferences, from examining the whole of the facts, under the following heads: 1. The same substance (oxyd of iron) is formed whether the iron is acted upon by hot steam, burned in oxygene air, or exposed, in the form of filings, to a sufficient heat in mixture with the red calx of quicksilver. 2. Where the iron is oxydated by the two latter processes, no hydrogene air is formed, though this is produced plentifully enough, when water comes in contact with hot iron. 3. The fixed air sometimes found after reducing metals in inflammable air, previously existed in their oxyds. 4. The water formed from the deflagration of oxygenous and inflammable airs, weighs just as much as the sum of the weights of the two gases. 5. The azotic air found in the residuary portion of the gases, was mixed with the airs before combustion. 6. The nitrous acid, when the combustion was rapid, proceeded from the union of azote with oxygene. 7. The experiments with barytes afford no evidence, that water enters into the constitution of permanently elastic fluids. 8. When water is acted upon by red-hot iron, it is resolved into its constituent parts, oxygenous and hydrogenous airs. And, 9. That on re-uniting the bases of these airs, there is a re-production of water.

The author then goes on to offer very proper and judicious solutions of the several objections contained in Dr. Priestley's third chapter, in the course of which, he gives his opponent credit for

his candour. He every where repels, with ability and skill, the attacks of the phlogistians; and shews himself well acquainted with the subject before him. The zeal he has shewn will be best understood from a perusal of the work itself: but the following extract, from the end of the second lecture, will give an idea of the confidence with which the professor recommends the antiphlogistic chemistry to his hearers:—"From the view which has been "given of the different explanations of the phenomena of com-"bustion, it appears that Becher's is incomplete; Stahl's, though "ingenious, is defective; the antiphlogistic is simple, consistent, "and sufficient; while Dr. Priestley's, resembling Stahl's but in "name, is complicated, contradictory, and inadequate. You, "doubtless, therefore, will be inclined to prefer the antiphlogistic "doctrine: Indeed, you may adopt it with safety; for, from being "a plain relation of facts, it is founded on no ideal principle, on "no creature of the imagination; it is propped by no vague sup-"position, by no random conjecture; it is dependent upon no-"thing whose existence cannot be actually demonstrated; whose "properties cannot be submitted to the most rigorous examina-"tion; and whose quantity cannot be determined by the tests of "weight and measure."

Upon the whole, while we express our opinion, that Professor Maclean has acquitted himself reputably in the present publication, and meritoriously supported the chemical character of the Seminary and State to which he belongs, we would advise our readers to beware, even at this time, of too much positiveness, while the experiments of Mrs. Fulhame and Mr. La Marc, now before the public, appear to require solution upon the antiphlogistic theory, and reconcilement with it.

ART. III. *Agricultural Experiments on Gypsum, or Plaister of Paris; with some Observations on the fertilizing Quality and Natural History of that Fossil.* By *George Logan*, M. D. Philadelphia. *Baileys.* 8vo. pp. 18. 1797.

IN this short pamphlet, Dr. Logan has related five experiments made by himself, on the operation of gypsum in agriculture, which, he thinks, establish the following facts. First, That there is no difference between European and American gypsum. Second, That gypsum acts as an immediate manure to grass, and afterwards in an equal degree to grain. Third, That one dressing will continue in force several succeeding crops. These experiments, which occupy eight pages of this publication, are the most valuable parts of its contents. The remarks on the natural history

of gypsum are superficial, and far less extensive and methodical, than may be seen in Cronstedt's Mineralogy, or almost any of the modern publications on chemistry. The same may be said of his observations on calcarious earth. They, however, are well calculated to impress the minds of those readers who love conciseness, and to whom, general ideas, conveyed in common language, are more welcome and more intelligible, than profound scientific details expressed in technical terms. And, on the whole, we consider, that every cultivator, and especially such as employ gypsum, may peruse this piece with advantage.

ART. IV. *Agricultural Inquiries on Plaister of Paris. Also Facts, Observations, and Conjectures on that Substance, when applied as a Manure, &c.* By *Richard Peters.* Philadelphia. *Cist and Markland.* 8vo. pp. 111. 1797.

WITH great pleasure we announce this small publication, which is intended, as the author modestly says, "to invite "as well as to give information," and which is collected chiefly from the practice of farmers in Pennsylvania. The subject of manures appears, as yet, to be in need of much further elucidation than it has hitherto received; and on scarcely any article of the whole tribe of fertilizing substances, is a rational theory more wanted, than in the case of gypsum. Mr. Peters has proceeded in the proper way to come to a right understanding of his subject, by laboriously and patiently collecting, not only the facts which fell under his own eye, but those which occurred to the intelligent farmers of the country around him.

The mode adopted to collect information was by a circular letter, containing about a dozen queries. To these queries, answers have been returned by Messrs. West, Frazer, Price, Hand, Curwen, Sellers, Duffield, Wharton, Roberts, Heckewelder, and by Mr. Peters himself. So that the materials collected are to be considered as the result of the agricultural experience of these respectable cultivators. They all agree in the vast utility of gypsum as a manure in most parts of Pennsylvania, where it has been tried. It seems to be agreed on, that after ten or eleven years use, the gentlemen still entertain their good opinion of it; that it remarkably brings to exhausted and impoverished soils; that one bushel and a half, or two bushels, will be sufficient, if yearly repeated, for clover; that it will answer well in a sandy loam, upon a lime-stone bottom; that though it is serviceable when strewed in powder, on growing plants, it succeeds best in repetition, after cultivating and dressing slightly with stable manure, or with

ploughing in green manures. As to the supposed sterility occasioned by gypsum, Mr. Peters observes, that his own experience teaches him it does not exhaust more than other manures do, particularly dung, and that to produce its full effect, it must have something to feed on, as some farmers express it; that is, as we suppose, to be valuable and active, gypsum must meet with something in the soil to decompound it; and where this is wanting, the plaister of Paris does no good. When strewed on the surface, it most remarkably benefits white and red clover and most grasses; though it did not appear to do any good to winter grain. It is good for all leguminous plants, buck-wheat, flax, hemp, rape, and oily-seeded plants; most products of the kitchen-garden, and for fruit-trees; as well as for oats and barley, when sprinkled at sowing time on the wetted seeds. Mr. Peters has sowed gypsum at all times of the year, and has found it answer well, if strewed over the land at any time from the beginning of February to the middle of April; and he directs it to be sowed in misty weather, to avoid the loss of having it blown away with the winds, if sown in a dry time. Some do not sow it until vegetation begins, though our author thinks it will have an effect, if sowed at any season. As to the quantity of produce by the acre, Mr. Peters affirms, he gets as much from gypsum as from any other manure; that the hay is better than that produced by dung; that the cattle waste less of it; and if the grass is used for pasture, the creatures are much more fond of the *plaistered* than of the *dunged* produce. He is satisfied with a ton and a half the acre, at a cutting; he mows twice, and has a third growth for grazing afterwards. Its durability is such, that though sometimes it will be exhausted in one year, yet the effect of one dressing, of three or four bushels to the acre, has been felt for five or six years, gradually decreasing in its powers, and seems to be capable of prolonging the efficacy of dung; and has been known to do good, when sowed repeatedly, and in small quantities, for a continuance of twelve years and more. The author expresses himself with much propriety, on the pernicious increase of weeds, through the neglect of husbandmen, and thinks the French gypsum preferable, for agricultural purposes, to that brought from Nova-Scotia. We believe with him, that there is a great variety in the gypsums, and are of opinion, that in order to make the whole subject well understood, there should be a set of correct and well-conducted experiments, on the actual composition and relative properties of the several sorts of plaister. But who that can be relied on will undertake this inquiry?

In Mr. Peters' chapter of miscellaneous observations, we find many judicious and excellent practical remarks, and towards the close of the performance, some attempts to generalize the nume-

rous facts he is possessed of, into something of theory. If he has not, however, ventured boldly upon this, he has prompted another cultivator (Dr. Mitchill) to undertake it in a memoir intended as a sequel to Judge Peters' pamphlet, and which may be seen in the first number of our Medical Repository, p. 30, where this matter is amply discussed. To this we refer our readers.

We cannot dismiss this work, without expressing our high approbation of the care and candour which the author has shewn. It should be an example as well as an incentive to other collectors of facts. And if we do not go deeper into the detail of the contents of this valuable publication, it is that we may induce our readers to peruse the work itself.

ART. V. *An Inaugural Dissertation on the Bilious Malignant Fever, read at a public Examination in the University of Cambridge, for the Degree of M. B. July* 10, 1797. By *Samuel Brown*, A. M. Boston. *Manning and Loring.* 8vo. pp. 54. 1797.

THE town of Boston, like most other sea-ports and places in the United States, where men croud together, and make the same spot for a long time the place of their settled residence, generation after generation, has experienced something of the pestilence. In the year 1796, particularly, the distemper was more than usually alarming, and both on account of the violence of its attacks, and the numbers it invaded, became a subject of very serious consideration. Mr. Brown has undertaken to describe the forerunners and symptoms of this malady, as well as to investigate its cause, prognosis, cure, and prophylaxis.

He observes, that the scarlatina, scarlatina anginosa, measles, dysentery, and cholera morbus, were the diseases which successively prevailed, and some of them with unusual mortality, until the month of August, when the more powerful influence of the endemic he describes, converted them all to its own form and nature. This remark, we consider a valuable one, as it evinces the connection of all the diseases known by those names, with one common cause.

Mr. Brown then makes a digression upon poisons, which he divides into animal, vegetable, and mineral. Animal poisons are *natural* secretions, like the venom of the viper, &c. or *morbid*, like syphilitic virus, &c. These are communicated either in the state of gas, through the atmosphere, as in fevers, or in a liquid form, by contact, as in lues. They operate as stimuli upon the excitability, or sensorial power of the constitution, and can produce therein but *one action at a time;* and *when the constitution has expe-*

nienced this action, it becomes no longer susceptible of it afterwards. We would here request Mr. Brown to consider, that we have seen recently a case, where the human constitution was under the operation of mercurial salivation, intermittent fever, and syphilitic contagion, all at once; and we beg him to remember, that though re-infections in plague, yellow fever, &c. are not very common, yet there are now and then instances of their occurrence.

The same hasty spirit of decision, with which the author made the preceding unqualified assertion, leads him next to observe, that poisons, measles, and morbific effluvia, are of too subtle a nature for chemical analysis, and that their constituent materials are utterly unknown. That they may be unknown to him we shall not presume to deny; but that the composition of many poisonous substances is very well understood, we have no doubt. Are not the various combinations of quicksilver, lead, copper, and arsenic, with oxygene and acids, very well understood? Do we not comprehend the constitution of carbonic acid gas? And are not the various animal exhalations composed of azote, charged with various degrees of oxygene, well understood, both synthetically and analytically? How then can the author affirm, we know nothing about them? It is true, the precise constitution of a number of them is as yet unknown, but it by no means appears, that their nature is too subtile to be detected. On the other hand, Dr. Mitchill's ideas, now corroborated by the very recent experiments of Mr. Eaglefield Smith, shew, at least, the probability of the greater part of them having septon (azote) for their basis.

Mr. Brown seems half inclined towards an animalcular hypothesis of poisons. We have heard of an animalcular hypothesis of fire and of electricity. And there has been an animalcular account of dysentery, and of epidemic fevers. It would be quite as easy to make an animalcular hypothesis of light, attraction, or any thing else.

There is another unqualified general remark of our author, which deserves animadversion, "that the more simple and homo-"genous a substance is, the more powerful and active it is;" this, he says, is an universal truth. Is this the case with carbone, sulphur, or hydrogene? Are acids simple bodies? And is it to their simplicity and homogeneiety, these powerful substances owe their activity? Are quicksilver or arsenic active in proportion to their simplicity? or do they acquire their stimulant and other remarkable qualities, by being *compounded* with oxygene and acids? But of this enough. Mr. Brown goes on with the history of the symptoms, in pretty much the common form, except "that there "was found in many instances, a *porraceous* (green as leeks) sub-"stance, resembling the settlings of coffee." He next delivers his prognosis, and enters upon the rationale of the proximate cause.

This he makes to be a portion of the (unknown) morbid effluvium swallowed with the saliva, and stirring up various disorders in the alimentary canal, and inducing irregular and morbid action in the abdominal and thoracic viscera. He says, the "life of "the blood is either greatly impaired or totally destroyed;" and thence proceeds to discuss the questions, whether the blood is alive and organized or not? what is life? and wherein life resembles soul? whence soul is derived? &c. In doing which, after quoting Fothergill, Darwin, Cullen, and Hunter, he seems to us, to adopt the metaphysical notions of Swedenborg, and to be tinctured by sentiments imbibed from his doctrine of influx. We remember when we looked into this performance of the apostle of Sweden, we did not well comprehend it; nor do we better understand the application of his opinions, by his disciple, to explain the physiology and pathology of human bodies. Mr. Brown, however, with great propriety, calls the alimentary canal "the store-house of contagion." In his chapter of predisposing causes, Mr. Brown makes judicious remarks; and his method of cure consists in lowering the excitement by depletion, even by blood-letting, with all possible speed. He commends jalap and calomel very highly as a cathartic composition, in the dose of twenty-five grains of the former to ten of the latter. After the effectual operation of which, by producing four or five discharges, other purgatives, such as the sulphate of soda, tartrite of pot-ash, rhubarb, senna, manna, &c. are recommended.

The author further advises the whole body to be cooled, by cloths dipped in cold vinegar and water; and the like applications to be made to the head, neck, and back, when these are distressed with pain. He recommends plentiful dilution, by watery subacid and small drinks; and forbids the use of food until after the crisis. He directs particular attention to every kind of cleanliness and ventilation. If, notwithstanding all these things, the excitement should not be seasonably abated, but run into indirect debility of the typhoid or malignant kind, he advises the tonic and stimulant plan to be pursued, but cautions against the use of the diffusible stimuli, which may exhaust the remaining powers of the constitution. A few cases from Dr. Warren's practice, chiefly unsuccessful, and some preventative directions, conclude this dissertation.

As a sequel to it, Mr. Brown has ventured to criticise some of Professor Mitchill's opinions concerning the operation of septic or pestilential fluids upon the human body. In this part of his dissertation, Mr. Brown does not appear to us to have perfectly comprehended the system he attempts to refute. This will more clearly be seen, by a cursory examination of several queries and objections which successively occur.

Mr. B. asks, why Dr. M. rejects the idea of *putrid ferments* in the mass of fluids?—To this it may be replied, that putrid water, putrid air, &c. being all highly antiseptic, there is no evidence of the existence of any putrid ferment. Mr. B. inquires, why not call those diseases which are so suddenly destructive of life, *putrid?* Answer—because putridity is incompatible with life, and consequently does not invade the body until after life ceases to influence it.—Why say that septon is antiseptic?—We believe that Mr. B. will be dificulted to discover any such assertion in Dr. M.'s publications. A more diligent examination will probably shew the following statement of Dr. M.'s doctrine concerning azote, or septon, (as the Dr. calls it) to be accurate, viz.—That septon, when existing in too great quantity in the animal nerves and muscles, does, by its redundancy or surplusage, give those living parts a looser texture or cohesion, and a tendency to be disorganized or disconnected, as in scurvy and in scorbutic fevers, bordering on or approaching to the malignant and pestilential forms, but that, as soon as septon is chemically combined with oxygene, it possesses the properties common to acids and the things vulgarly termed antiseptics.—Mr. B. thinks every change in the mass of fluids must be putrefactive: Dr. M. on the contrary, maintains that the fluids in the blood-vessels may be changed in an indefinite number of ways, without being in a putrid state at all; nor will Mr. B. probably hesitate to adopt the same sentiment, after a more leisurely and extensive survey of the facts which relate to the various states of that fluid.—The author suspects that Dr. M. has been led to adopt his opinion from *appearances*. This is undoubtedly the fact: and Dr. M. and every other physician would be very much to blame if he made up his opinion in any other way: for what are the whole of the *phenomena* of nature but *appearances?* and what is the business of the man of science but to interpret them?

ART. VI. *An Inaugural Dissertation on Camphor.* By *John Church*, A. M. Philadelphia. *Thompson.* 8vo. pp. 70. 1797.

FEW articles of the Materia Medica have given rise to more diversity of opinion, or to greater contrariety of pretended facts than Camphor. To mention these particularly would be to implicate some venerated names in censure, and to exhibit such an uncertain and conjectural aspect of our art, as would neither be honourable to medicine, nor to medical writers.

In prosecuting the natural history of Camphor, Mr. Church delivers the botanical description of the Laurus Camphora, the tree

from whence it is generally obtained; the places where it usually grows; a catalogue of plants which yield smaller quantities of the same substance; the different modes of procuring and manufacturing it; and the changes produced in it by some of the most noted agents of chemistry.

In order to take a more comprehensive survey of the operation of Camphor on the principles of organic life, our author instituted a series of experiments to ascertain its effects on the growth and economy of vegetables. From these experiments it appeared that, generally, vegetables thrive more in water impregnated with Camphor, than in simple water. This result, however, was not uniform; for some died much sooner in the camphorated, than in the pure water. And this variety is ascribed by our author to the violent impression of this stimulus on the irritable system of some plants, inducing indirect debility in such degree as to terminate in death.

The experiments on plants are followed by an account of the effects of Camphor on the human body. Applied to any part of the body, where the cuticle has been removed, to the eye, or to the internal membrane of the nose, it induces a sense of heat, with redness and pain. After these have subsided, the irritability of the parts is diminished.

When taken into the stomach, Camphor is found to produce the following effects. The pulsation of the heart and arteries is rendered quicker, more frequent, strong, tense and full; then, after a little time, it becomes slower. With the increased frequency of the pulse, there is an augmentation of heat, flushings in the face, &c. Respiration is little affected, when the dose has been moderate; but when very large doses have been given to animals, the breathing becomes difficult, slow, and laborious.

The stomach is rendered incapable of digestion from the operation of a large dose of Camphor; anorexia, nausea, and sometimes vomiting take place. In the intestines, it sometimes produces cathartic effects. The secretions and excretions are generally increased, particularly those of perspiration and urine.

The mind is affected by Camphor in the same manner as by other diffusible stimulants; it is first excited to cheerfulness and gaiety; then, if the dose be larger, comes on the delirium of intoxication, followed by languor, drowsiness and disinclination to motion. These several effects of the internal use of this substance are supposed, by our author, to be clearly deducible from the numerous experiments which he details in the dissertation before us.

Mr. Church relates a singular and curious case of a woman, who, from the casual application of Camphor, as a remedy for tooth-ach, contracted a fondness for it so fascinating and irresistible, that she, at length, consumed it in large quantities; and could not be induced to relinquish it, by all the remonstrances of her

friends, or her own conviction of its pernicious effects. The avidity with which stimulants are taken, the inclination of mankind to abuse them, and the readiness of the palate to sacrifice its most decided aversions to their domineering influence, are strongly illustrated by this case. To persuade men to abandon indulgencies of this kind, is a hopeless task. If ardent liquors should cease to be the bane of the Christian, and opium of the Mahometan world, the extensive class of stimulants would still afford a multitude of substitutes, equally alluring and fatal, as those far-famed destroyers of the human race.

We feel great pleasure in paying our tribute of acknowledgement and respect to the author of this dissertation. Not contented implicitly to admit the opinions of some very distinguished physicians, Mr. Church has inquired for himself, and thereby been enabled to detect their mistakes, and refute their reasoning. His experiments are ingeniously devised; the mode of conducting them appears to be marked with diligence and precision, and most of his inferences are legitimate and conclusive.

ART. VII. *A Chemico-Medical Essay, to explain the Operation of Oxygene, or the Base of Vital Air, on the human Body.* By *Benjamin De Witt.* Philadelphia. *Woodward.* 8vo. pp. 35. 1797.

THE doctrines concerning the operation of factitious airs on the human body, are now become so important, as to attract much attention and interest in every country where medicine is liberally cultivated. Although still very imperfect, this subject discloses a prospect so expanded and fruitful, in respect both to speculation and practical utility, that the most cursory and dispassionate observer cannot behold it without feeling some portion of the enthusiasm, which such a scene is calculated to inspire. In the hope of possessing these more simple and energetic remedies, the Materia Medica may be expected, without regret, to part with a huge mass of ambiguous and inert articles, which have overwhelmed it for ages. And the animal constitution, analized to its first principles, will lead physicians to employ means of securing health, and treating diseases more, conformable to truth and nature.

In the essay before us, Mr. De Witt, after stating, in perspicuous terms, the common doctrine of the composition of the atmosphere, proceeds to deliver the history of oxygene. As this substance, on account of its great attraction for other bodies, has never been obtained in a separate state, he chiefly treats of it as combined with caloric, which maintains it in the form of elastic fluidity; and,

in this state, he considers it as employed in the respiration of animals, in the combustion of inflammable, and the putrefaction of animal and vegetable substances.

The agency of oxygene, in the functions of the lungs, forms one of the most interesting objects of physiological inquiry. The mode of its introduction by that organ, is particularly described by our author. He also supposes, on the ground of many facts, as well as the opinion of several respectable writers, that large quantities of oxygene are absorbed by the stomach and intestines, and also by the skin.

That the difference in the colour of venous and arterial blood is wholly to be ascribed to the operation of oxygene, our author hesitates not to conclude. In attempting to explain this appearance, he thinks it most probably owing to iron, reduced to the state of red oxyd. He admits, however, the difficulty of explaining how so small a portion of iron as the blood contains, should diffuse that florid colour through so large a mass of fluid; and he does not believe, that iron has so strong an attraction for oxygene, at the ordinary temperature of the body, as to account satisfactorily for the instantaneous change which takes place in the blood circulating through the lungs. The coagulability of the coagulable lymph, he refers, agreeably to the result of Dr. Beddoes's experiments, to the operation of oxygene.

The author proceeds to consider the influence of oxygene, in producing animal heat, as a stimulus essential to the action of the heart and arteries, its agency upon the nerves, brain and mind, and particularly as affording the material for the secretion of the vital principle by the brain, or medullary part of the nerves, its use as a nutriment, and its effects on the fœtus in utero.

In treating of the morbid effects of oxygene, the author adverts to the opinion of Dr. Beddoes, concerning a superabundance of it in phthisical patients—to the conjecture of Dr Rush, that an excess of it in the atmosphere may dispose to epidemic and malignant diseases—to the doctrine, maintained by Dr. Mitchill, of the noxious effects of certain combinations of oxygene and azote—and to the observations of Dr. Darwin, concerning the corrosive and fever-producing qualities imparted by the oxygenous portion of the atmosphere to the matter of cancer, abscess, small-pox, &c.

As a remedy in certain diseases, we may expect much from oxygene. It exhibits all the characters of a powerful and durable stimulus. Great benefit, our author observes, has been experienced from it in asphyxia, arising from different causes, in scurvy, typhus, asthma, cancer, schrophula, herpes, hypochondriasis, chlorosis, dyspepsia, melancholia, &c. The prospect of obtaining an adequate remedy for these destructive disorders, some of which are the reproach of medicine, and more especially a remedy of such

easy and agreeable application, will be consoling to every friend of mankind. The important practical question, whether oxygene, like other stimulants, exhausts excitability, is left, in a great measure, untouched by our author.

On the several points comprehended in this essay, Mr. De Witt has derived his information from the most authentic and respectable sources. He has, indeed, neither made, nor proposed any new experiments; he has not inriched the common doctrines by any novel assemblage of facts; nor do we perceive any thing in his combinations or reasoning that can be pronounced original. He possesses, however, the merit of having selected an interesting topic; of presenting the matter, collected from various sources, in a lucid and natural order; and of contributing his exertions to disseminate the knowledge of a subject far too little regarded or understood in the United States.

ART. VIII. *An Inaugural Dissertation on Fractures, &c.* By *Robert Black, &c.* Philadelphia. *Ormrod and Conrad.* 8vo. pp. 46. 1797.

IT is pleasing to observe the improvements which are making, in our country, in every department of the extensive science of medicine. Surgery and Chemistry, in particular, which have languished, till very lately, in a state of barbarous neglect;—the last confined to a few of the simplest processes of Pharmacy, and the first to the treatment of the commonest injuries, and oftentimes but partially successful even in them;—are now ready to assume their proper rank among the subjects of medical curiosity and attention; and by their more sedulous and enlightened cultivation, promise to diffuse extensively the blessings of health and comfort.

In the essay before us, we observe multiplied proofs of vigorous application to that branch of the healing art which seems principally to attract the author's regard. The praise of novelty and ingenuity certainly belong to it. We wish it were in our power to commend the prudence and judgment of the writer with equal freedom. But we have found reason to dissent from several of his opinions, which we shall examine with the less reserve, as we have no doubt, that future experience will forcibly compel his relinquishment of them, and dispose him, while he adopts a more cautious line of procedure, to think favourably of the liberty now exercised in respect to him.

The observations of Mr. Black upon the causes which most frequently produce fractures, appear to be well founded. There can be no doubt that muscular action has a great agency in their

production, and, in particular, fractures of the patella happen, we believe, nine times out of ten, from muscular exertion alone.

From the consideration of the causes of fractures, Mr. Black proceeds to lay down rules for the treatment, and to examine that which has heretofore been proposed by others; and he observes, that "Mr. Pott has magnified the *bent position* in fractures into an "improvement of more general utility than experience would "seem to warrant." It is not uncommon in the proposer of any improvement, or fancied improvement, to carry matters to an extreme; and we fear that our author has been led inadvertently into the same error. It may be acknowledged, that cases do sometimes occur, in which the *straight position*, so universally recommended by Mr. Black, may have advantages over the bent one; but, in general, we are persuaded, that the bent position will not only allow us more easily to effect a reduction of the fracture, and to retain the bones in accurate coaptation, but will also be attended with fewer untoward symptoms. Nor do we by any means admit the impracticability, in the bent position, of using the sound limb as a criterion to determine whether the parts are completely replaced. Supposing the leg fractured, and placed according to Mr. Pott's direction, can there be any difficulty in bringing the well leg parallel to, and in contact with it, to ascertain whether it is of a proper length? But this objection to the bent position is of very little consequence, because the necessity of having recourse to this criterion very rarely occurs. In fractures of the leg, the deformity is easily detected. As long as it exists, we may be certain, that the limb is not duly adjusted; and, as soon as it is made to disappear, we may be satisfied that the bones are in their proper place.

Mr. Black very justly observes, (p. 22.) that "the action of "muscles forms the great obstacle to the reduction of fractures." But, if this be true, does it not follow of necessity, that the more we relax the muscles, the *less* will be the difficulty attending the reduction? And, is it not in the bent position that the greatest number of muscles are in a relaxed state? The premises of the author seem to lead directly to a conclusion, subversive of his own doctrine. It is upon the same general principle, that bones are, with less difficulty, *retained* in a state of coaptation in the bent position, than when the limb is straight. For the simple extension of a muscle is a powerful stimulus to its contractile power; and the muscles being considerably stretched, in the extended posture of the limb, they are, in consequence, constantly endeavouring to displace the fractured bones.

But let us dismiss reasoning for a moment, and attend to facts.

It very frequently happens, that when a fracture takes place, the patient himself, or those who may chance to be immediately

present, dispose the broken limb in a straight position. When the surgeon arrives, he finds his patient complaining much of pain, and the bones deranged. He immediately attempts to reduce the fracture; but his efforts are unavailing, and he increases the pain, without effecting the reduction. The surgeon, then, we will suppose, places the limb in the bent position. The first effect of this change of posture is an alleviation of the patient's suffering; and the next advantage is, that but little, if any, difficulty remains in the way of making such extension as is necessary to coaptate the bones. And this, which is a common case, is direct evidence of the superiority of the bent over the straight position; and may be opposed to those instances recited by Mr. Black, in which the patients were more easily managed by a contrary method. The only question to determine is, which mode of treatment has been attended with the greatest success; and on this point, we have no hesitation in asserting that the great weight of evidence would be in favour of the bent position.

In respect to the posture of the body, it may be easily admitted, that that which is the most natural and easy is the best. But is a horizontal position on the back, more natural than lying on the side? Do people most generally lie extended on their backs, when they sleep? If the natural position is that which is most frequently observed, we cannot help thinking, that lying on the side is quite as natural as lying on the back. But it is futile to contend about the *natural* position, when, in fact, there is no such thing. Every position is fatiguing when long continued; and we are constantly changing to obtain ease. When, therefore, it is declared by the author, (p. 14.) that he "never saw a patient put "on his side, with a broken leg, who did not, in a few hours, "turn on his back, in spite of every effort to obey the injunctions "of his surgeon;" we may fairly conclude either that the patients were not placed properly on their side, or that the observations of the author have been extremely limited. For no surgeon, whose opportunities for observation have been ordinarily frequent, can have failed of seeing many cases, where patients remained upon the side without difficulty. It were certainly very remarkable, if so much difficulty, as Mr. Black supposes, did actually exist, that it should not have occurred more forcibly to the view of the principal modern writers on surgery; nor is it credible, that Mr. Pott himself, with every allowance for prejudices in favour of his own treatment, should not, in this case, have been struck by its so frequent recurrence. But, admitting that patients are inclined to turn on the back, they do this only to a certain degree; and it is obvious, that in this position of the trunk, the leg and thigh may be bended, so as to give the full effect of a relaxed state of the muscles, and enable the fractured bones to be kept with ease in

their proper situation: and there is this further advantage in this posture of the limb, that it enables the patient to enjoy the relief of changing occasionally the position of the body from the side to the back, and the contrary.—The unqualified assertion of our author, that the grand object for which a surgeon is employed would be defeated if the patient were confined to lie on his side, argues but little experience on his part, and too little attention to the experience of others: and, so far from being a *lucky hit*, it is the common result of every day's practice, with judicious surgeons, to preserve the leg straight, after a fracture has been treated in the bent position.—We admit the tendency of the large extensor muscles of the foot to pull the broken ends of the bones past each other. But this is, most indubitably, a reason for preferring the bent position; because the disposition of the gastrocnemii to contract is always great in proportion as they are stretched; and it is the straight position which has this effect: whereas, by bending the leg upon the thigh, those muscles are relaxed, and, of course, placed in a condition little disposed for action. Mr. B. observes, that the straight position affords a complete antagonist to the gastrocnemii. But it should be a chief object with the surgeon to place the limb under circumstances not to require the action of antagonizing powers; and we apprehend the limb to be placed under those circumstances when it is bent and properly supported. Or should any means be necessary to counteract the extensor muscles, they are easily found in a splint extended from the ham to the heel, and a little below it, *and not by the application of splints to the fore part of the leg*. It certainly was fortunate for our author that he had seen so little advantage derived from splints applied to the fore part of the leg; and he saw all that could reasonably be expected. But he has cautiously avoided mentioning a splint in the opposite situation, because here it must obviously have the same effect as placing the leg upon the heel; for it is the same thing, whether we carry the leg to the support, or bring the support to the leg.—The objection to splints, because, through negligence of the surgeon, in not guarding them sufficiently with tow, or some soft materials, they sometimes produce sores upon the ancle, scarcely deserves a consideration; for it is only from neglect that they are ever productive of this mischief.

In fractures of the patella, our author observes, that "the "straight posture alone is admissible." But he is less fortunate here in his opinion than on the occasions we have already noticed; for experience teaches us, that the *bent* position alone is admissible in fractures of the patella. But we must be understood to mean, that *it is bending the thigh on the trunk* which is particularly required in treating a fracture of this bone. Mr. B. remarks, that "the "action of the extensor muscles of the leg renders it almost im-

" possible to keep the fractured pieces in contact;" and when the treatment is conducted in the straight position, we know this to be the case. But we also know, that, in the bent position, it is generally an extreme easy matter to put and keep the broken pieces of bone in complete apposition. The source of error, among surgeons, when they are laying down rules for the management of these fractures, has been in their not considering the extent of the muscles which are concerned. If all the extensor muscles had originated from the thigh bone, and gone to the leg in the way in which they in fact now do, to have extended the leg upon the thigh would have been doing all that was in the power of art, as far as it regards position. But there is one of the extensor muscles, and by much the most powerful too, as it respects the patella, which has its origin from the pelvis, and at a considerable distance from the center of motion of the hip joint. From this circumstance it is, that the bent position is so necessary; because it is by flexing the thigh alone, in fractures of the patella, that we relax the extensor muscles of the leg, which is the thing required, in order to enable us to bring down and retain the superior portion of fractured bone, in contact with the inferior. To extend the leg upon the thigh is useful, inasmuch as it raises the inferior portion of bone; but it does nothing more. In the sound state of the limb, straightening the leg has a considerable effect in relaxing the extensor muscles; but even in this state, the flexion of the thigh has that effect in a much greater degree. When the thigh is much bent upon the trunk, to extend the leg completely is sometimes productive of uneasiness in the course of the flexor muscles of the leg, which may require it to be kept a little bent upon the thigh: and this may be allowed of, without materially affecting the broken bone; because the insertion of the ligament of the patella is so much nearer the center of motion than the tendons of the flexor muscles, that a small flexion of the leg will produce scarcely a sensible depression of the former, while it procures perfect ease to the latter.

From these observations, it necessarily results, that the *bent position* is to be preferred in transverse fractures of the patella; and were it necessary, a number of cases might be subjoined, which, under this treatment, were attended with the most perfect success—the patients having as entire an use of the limb after as before the accident.

The length at which we have examined the first part of Mr. Black's dissertation, unavoidably obliges us to pass over a number of points of inferior consequence, and to hasten to the consideration of his second leading doctrine. And here, for the same reason, we shall confine ourselves to a few cursory remarks; pretty much in the order of the author.

A very large portion of the Essay under review, is devoted to the strenuous recommendation of blood-letting, in the various kinds and stages of fractures. The author even urges recourse to this remedy, in every case where difficulty is found in effecting a reduction. Of the efficacy of venæsection, and of the propriety of employing it more extensively than is commonly practised, not only in accidents of the kind now considered, but in numerous other morbid situations of the human body, we have no doubt; that it may be advantageously resorted to in fractures and luxations of some duration, seems as little questionable; but as a general practice, and for the *mere purpose of inducing relaxation*, we cannot so heartily concur with Mr. Black in recommending it. This gentleman's enthusiasm for a favourite remedy, certainly carries him too far, when it leads him to suppose it so singularly useful, in cases where bones are protruded through the integuments; since a simple incision will generally afford sufficient room for their reduction, at the same time that it disposes the lacerated integuments more readily to heal. But, if this were not the fact, where is the *cruelty* of removing a piece of bone? an operation which excites little or no pain, and which seldom fails of answering the purpose of the operator.

In the subsequent recommendations of the lancet, for the removal or prevention of inflammation; and to prevent mortification from whatever cause, we see little room for exception. A longer and independent exercise of his profession will, no doubt, temper the author's personal zeal; which will produce no improper effect on the minds of those who have already been some time engaged in it. On those who prescribe bark and wine, in cases of recent fracture, if such persons are not the offspring of the author's own imagination, we fear it will have little influence of any kind.

With regard to that convulsive action of the muscles, in consequence of fractures, which Mr. Black enumerates, as among the events which demand the freest use of the lancet, it may be remarked, that though instances of this nature may and do occur, in which bleeding will be serviceable and is indispensible; yet it is equally certain, that cases of this kind may and do happen, in which no prudent surgeon would advise it. What is true of every other remedy is true of this, that the peculiar circumstances of each case must determine the propriety or impropriety of its use, and to what degree. But, were it true, that bleeding would remove symptoms like these, in every instance, still this would not be a sufficient reason for its exclusive application. It must first be proved, that it is the most certain, safe, speedy, and pleasant remedy. And how has it happened that Mr. Black has so intirely overlooked an article of the Materia Medica, so universally com-

mended, for the removal of spasmodic affections, as opium?* Is he ignorant, that this alone is often sufficient to obviate them completely? That it proceeds still more certainly, in plethoric persons, after moderate bleeding? And if *he* should entertain any doubts on this point, will any intelligent and experienced practitioner hesitate to believe, that in the case recited by the author, (p. 29.) a suitable dose of opium, repeated at proper intervals, and preceded by one or two small bleedings, would have succeeded in vanquishing the convulsive motions, in much less time, and with much less hazard to the patient, than the method actually adopted?

We shall here take our leave of this Essay. Most of the remaining sentiments and directions are correct and proper. Some, it is true, are open to animadversion. But, though we have differed so freely and materially from the author, relative to several of the most essential doctrines which he has delivered, yet we cannot conclude without expressing our warm approbation of the spirit with which he has asserted his opinions, and our sanguine expectations of his future usefulness and distinction.

* In a late work (Townsend's *Guide to Health*, Vol. II.) we even find Opium recommended for another purpose, for which our author so much insists on the use of bleeding

"Mr. Gineſta, professor of the College of Surgery at Madrid," says Mr. Townsend, "has happily discovered, that opium, internally taken, and externally applied, in strong fomentations, to the contracted muscles, induces "such a degree of relaxation, as greatly facilitates reduction. In a memoir, "presented to the infant College, and which will be published, he mentions "several cases of long standing, restored in this way by him, after having "wearied the patience and frustrated the hopes of other practitioners."— And, a few years ago, a late practitioner of medicine in this city, proposed, on the credit of his own experience, to effect the same purpose, by Emetics, given till their operation produced universal relaxation.

MEDICAL FACTS, HINTS, AND INQUIRIES.

Facts relative to that Faculty of Animals which has been called INSTINCT.

1. *The following facts respecting a* WREN, (Motacilla Domestica Linn.) *were communicated to me by Mr. Julius Deming, a respectable merchant of Lichfield, Connecticut; who received them directly from the lady originally observing them.*

IN the spring of 1790 or 1791, the sister-in-law of this gentleman observed a wren attack the martens in a box prepared for them, and affixed to her father's house. After a short time they were driven from it, and the wren took possession, and began to construct her nest. Unwilling to lose the martens, and to injure the wren, the lady made use of this expedient. She placed a wooden box (of about the size of a gallon bottle), with a moveable cover, in which was a small hole, in the adjoining bee-house. Within an hour after this had been done, the wren deserted the marten-box, for that which was intended for her, where she built her nest, layed her eggs, hatched, and reared her young.

While the wren was laying, during the time of incubation, and after the birth of the young, the box in which the nest was formed, was often removed into the house; whither the parent-bird always followed, without exhibiting any particular marks of fear: at least, whatever apprehension she might have had originally, was wholly subdued by the frequent repetition of this practice.

When the young were pretty well grown, it was very interesting to observe the mother instruct them in her peculiar song. As this process was thought curious and singular, it attracted the attention of others beside the lady first mentioned; and all the circumstances were often observed by her friends, as well as herself, at their leisure, in her father's house.

The mother-bird fixed herself on one side of the opening in the box, directly before her young. She began by singing over her whole song, (which is known to consist of a considerable number and variety of notes), very distinctly. One of the young then attempted to imitate her. After proceeding through a few notes, his voice broke, and he lost the tune. The mother immedi-

ately recommenced where he had failed, and went very distinctly through with the remainder. The young bird made a second attempt, commencing where he had ceased before, and continued the song as long as he was able; and when he lost the note again, the mother began anew, where he stopped, and completed it. Then he resumed the tune, and finished it. This done, the mother sang over the whole series of notes a second time, with great precision; and a second of the young attempted to follow her. With him, she pursued the same course as with the first; and so with the third and fourth. It sometimes happened, that the young would lose the tune, three, four, or more times, in the same attempt. In which case, the mother uniformly began where they ceased, and sang the remaining notes; and when each had completed his trial, she repeated the whole strain.

Sometimes two of the young commenced together. The mother observed the same conduct towards them, as when one sang alone. This lesson was repeated, day after day, and several times in a day, till all the young had perfectly mastered it, and were full-grown; and, as has already been remarked, it was observed as often and by as many persons as knew of the fact and had curiosity, and by the lady above-mentioned, very frequently, so that no doubt can be entertained of the fidelity of the narration.

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2. *The following relation was likewise made to me, by Mr. Deming, the gentleman mentioned as the communicator of the preceding facts.*

IN the spring of the year 1793 or 1794, a male and female ROBIN* built their nest in the well-crotch, behind the house of Mr. Deming, and but a few feet from the door. Nothing peculiar was observed in their demeanour, during the time of incubation, or before. After the birth of the young, the mother manifested the most extravagant joy and pride; and (contrary to what is believed to be the

* *Turdus Migratorius Linn.* Dr. Waterhouse (Morse's Universal Geography, Vol. I. p. 209. Note.) erroneously supposes that our robin is not the turdus migratorius of Linnæus. It is true, I believe, that this bird is peculiar to America. The mistake of Dr. Waterhouse probably arose from his observing this bird inserted in the catalogue by the name of robin redbreast (by which name it is called in some parts of the United States, in others simply the robin); whence he may have thought that the author of the catalogue meant to designate the English robin red-breast, which is a very different bird, it is true, not a native of this country, and is the *Motacilla rubecula* of the Swedish Naturalist.

general practice of these birds), assumed to herself the exclusive right of feeding them. After distributing among them whatever she herself had brought, she has been (perhaps a hundred times, and by all Mr. Deming's family,) observed to take the worms, &c. from the bill of the male, and distribute them likewise.

When the young birds were about half-grown, the lady of this gentleman accidentally witnessed the following singular circumstance. The male and female came to the nest with worms. The female, as usual, parted her's among the young; when the male (as it were, desirous to assert the equality of his rights) made a motion to distribute that which he had brought. Immediately the female, with violent expression of anger, snapped her bill together with a noise so uncommonly loud, that it might have been heard some rods, and the terrified and submissive husband instantly desisted, and remaining motionless, quietly permitted her to take the worm from his bill, and distribute it herself as before. After this, the male seems never to have made a second attempt to recover his authority; as it was always observed, that though he brought food as well as the female, he uniformly acquiesced in her exclusive distribution of it.

And this was noticed after the circumstance above-related, very many times.

3. *The next set of facts also relate to the* ROBIN (turdus migratorius); *and though less curious than the preceding, tend still further to illustrate the character of this bird. They were communicated to me by my father, Mr. Reuben Smith, of Lichfield, Connecticut.*

HE informs me that a *robin* has annually, for some years, built her nest in a stately pine-tree, directly before his window. Two years since, her nest was thrown down, and the young devoured by a red squirrel: but this accident did not prevent the bird from returning the next year, and the present. The last spring, she began to construct her nest as usual; but before it was completed, a blue-jay and several black-birds frightened her away, took possession of the tree, and built their nests in it. This was an usurpation which they were not permitted to enjoy. After they were all shot and their nests completely destroyed, the robin returned, built anew, laid, hatched, and reared her young as in former years.

4. Extract of a Letter from T. Reeve, Esq. (an eminent Counsellor in Connecticut) to Mr. R. Smith, of Lichfield.

"AT this distance of time, it is probable that very many things which I observed respecting the ROBIN which I mentioned to you, have escaped my memory. Among many singular instances of sagacity, I remarked that the robin (who had his perch in the room where I lodged,) understood me perfectly well when I called in the morning to a young woman who lived with us, informing her that it was time to rise. If it happened that I did not awake her by calling, the bird would fly from his perch into her room, and after making all the noise in his power, if this did not answer his purpose, would get upon her head, pull her hair with his bill, and peck her in the face till she awoke.

"It was certain that he was capable of improvement; for, after practising for some time in the manner just mentioned, he assumed the office of awaking her himself, whether I called or not. About the same time in the morning, if the young woman had not risen, he regularly awakened her.

"When evening came, the bird perched himself upon some chair in the room we were, till we went to bed; when he followed us to our chamber, and flew upon his accustomed perch.—I observed that his constant practice was in the evening, when he perched on the chair, to sing before going to sleep; and it was as uniformly his custom to sing, in the morning when first awakened.

"Whenever any of the family inquired where *Bob* (the name by which we called him) was, he answered, and continued to do so till it was certain that it was known where he was; but if any stranger, or person not belonging to the family, made the same inquiry, he remained silent. Yet, in that case, if a member of the family said to him—*Why do you not answer, Bob?* he replied immediately, and always remarkably loud."

Oct. 21, 1797.

"P. S. I forgot to mention, that a cat which was remarkable for catching birds in the fields, never offered to do any injury to this robin."

CONSUMPTION AND FEVER.

A patient of Dr. Croswel, of Kaat's-Kill, in this State, died lately of phthisis pulmonalis, of considerable duration. The Dr. informs me that his patient, after the pulmonary complaint had proceeded so far that a regular cough, hectic, and expectoration of pus had taken place, was seized, when absent on a visit to Connecticut, with a regular intermittent, which continued for two or three weeks, without any very important abatement of her phthisical symptoms. After the disappearance of the ague and fever, the consumptive symptoms increased in violence, till, in about six or seven months, they terminated fatally.—It is further to be remarked, that the phthisis of this patient was supposed to have been occasioned by a severe intermittent, from the effect of which her constitution seemed never to have perfectly recovered.

Remark. One of two inferences would appear to be naturally deducible from these facts: 1st. That Mr. Hunter's doctrine of the incompatibility of the co-existence of two district actions in the system is unfounded—or, 2d. That the causes of phthisis and intermittent are only different in degree.

The following Case of LUMBAR ABSCESS, *remarkable for the Circumstances attending the Discharge of Pus, was communicated by Dr.* BORROWE, *too late for Insertion in the Body of the Work.*

"JOHN TOOLE, aged twenty-eight years, a stout muscular man, was admitted into the New-York Hospital, the 9th December, 1796, for the cure of Syphilis. Some considerable time after his admission, a large tumour was discovered in the right groin, or upper and fore part of the right thigh. The integuments were of a natural colour; and on coughing, there was a great influx of matter into the tumour. From these circumstances, together with his complaining of much pain in the loins, there remained no doubt of the disease being a lumbar, or psoas abscess. An operation was proposed, which he objected to; and, by some mistake of the house-surgeon, he was discharged. He was re-admitted the 28th of April, 1797. Some few days after, the contents of the abscess were let out, by a small puncture, made with a common lancet, as proposed and recommended by Mr. *Abernethy*. The discharge was large, mild, and inodorous. The

opening was carefully closed, and confined with adhesive plaister, and a bandage. Eight or ten days after, the tumour became painful and much enlarged; the integuments were now considerably inflamed; the patient's strength failed; he had frequent chills, night sweats, and a troublesome cough. The abscess was again opened, and about seven pounds of green fœtid matter discharged; the puncture was dressed as before. The cough, chills, and night sweats still continued, and he complained of great debility. He was put on the use of bark, wine, and elixir vitriol. Some short time after the last operation, the tumour burst, and discharged a large quantity of dark fœtid pus, which was so extremely acrid, as to excoriate the skin. The discharge gradually disappeared;—the opening healed up;—and he evacuated the same kind of matter in great quantities, with the urine: this continued during the greater part of the summer. It, however, became of a more mild nature, and he passed it in smaller quantities; his strength returned; the discharge ceased; and, on the 21st of August, 1797, he left the Hospital, cured.

It is now four months since, and he has not had any return of the complaint; his health is much mended, but the leg is still somewhat œdematous. Did this discharge of matter, through the urethra, take place in consequence of a direct communication between the bladder and cyst of the abscess? Or was it conveyed to the bladder by a retrograde action of the absorbents?"

In the IIId Part of his "Surgical and Physiological Essays," (which, I believe, has not yet reached America,) Mr. Abernethy has added a long Supplement to his Essay on the Lumbar Abscess. From this it appears, that he "has lately found this species of abscess more frequently connected with a disease of the bone than "he originally believed. In other cases, he has found his practice "to answer. Electricity, also, he has found so serviceable, with "occasional emetics, that he hopes many of those abscesses may "be dispersed without any permanent exposure of their cavity." [Monthly Review Enlarged, Sept. 1797.]

E. H. S.

METEOROLOGICAL OBSERVATIONS *for October*, 1797, *made by* GARDINER BAKER, *in the Cupola of the Exchange in the city of* New-York.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. S. r.	2 P.M.	Clear.	Cloudy.	Barometer observed at Sun-rise.	2 P. M.
1	56	58	E	N E		2	29 90	29 72
2	56	72	W	S W	2		29 60	29 50
3	61	77	W	W	2		29 52	29 44
4	66	56	S W	N W	1	1	29 6	29 4
5	45	62	W	W	2		29 45	29 56
6	54	70	S W	S E	2		29 65	29 55
7	59	70	S W	S W	1	1	29 62	29 59
8	56	67	S W	S E	1	1	29 55	29 28
9	54	62	W	W	2		29 35	29 48
10	42	49	N W	N W	2		29 64	29 67
11	38	53	W	S	1	1	29 75	29 78
12	38	52	N W	N	2		30	30 2
13	41	55	N E	S E	2		30 10	30 7
14	48	60	E	S		2	29 90	29 80
15	50	57	W	N W	2		29 74	29 74
16	39	55	W	W	2		29 74	29 69
17	40	60	W	S W	2		29 66	29 50
18	52	64	S W	N W	2		29 42	29 42
19	43	57	N W	N	2		29 65	29 67
20	42	61	N E	E		2	29 70	29 63
21	53	55	E	E		2	29 56	29 49
22	47	48	E	N E		2	29 15	29 22
23	47	58	W	W	1	1	29 43	29 50
24	45	49	S E	E		2	29 61	29 58
25	40	51	W	N W	2		29 67	29 71
26	40	54	W	S W	2		29 82	29 83
27	42	60	S	S	2		29 82	29 71
28	48	52	S	S W		2	29 50	29 40
29	43	47	S W	N W		2	29 38	29 35
30	34	44	N W	N W	1	1	29 53	29 58
31	40	53	W	W	2		29 71	29 70

Results of Meteorological Observations for October, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 47 6 hund.
Do. do. of the do. at 2 P. M. 57 7
Do. do. of the do. for the whole month, 52 6
Greatest monthly range, between the 3d and 30th, 43
Do. do. in 24 hours, on the 17th, 20
Six days it rained, and a very large quantity has fallen.
Two days it thundered and lightned.
Coldest day the 30th. Warmest day the 3d.

METEOROLOGICAL OBSERVATIONS *for November*, 1797.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. S. r.	2 P.M.	Clear.	Cloudy.	Barometer observed at Sun-rise.	2 P. M.
1	40	58	W	S W			29 75	29 77
2	46	63					29 99	29 99
3	48	66	S	S W			29 96	29 87
4	46	61	E	E		1	29 72	29 58
5	62	62	S	S E		2	29 10	28 85
6	40	48	W	W	1	1	29 29	29 39
7	34	41	NW	N W	2		29 78	29 75
8	35	48	W	S W	1	1	30	29 97
9	50	60	W	W	1	1	29 61	29 60
10	34	42	N	S E	2		30 1	30 5
11	40	44	N E	N E		2	30 7	30
12	58	61	S E	S E		2	29 62	29 40
13	50	58	NW	S W	2		29 60	29 57
14	50	56	S	W	1	1	29 34	29 34
15	34	34	N	N E		2	29 56	29 51
16	20	28	NW	N W	2		29 70	29 70
17	21	25				2	29 59	29 38
18	17	29	N	N W	2		29 60	29 64
19	27	34	W		1	1	29 58	29 50
20	25	31	W	W	2		29 68	29 58
21	26	32 50	W	N		2	29 58	29 63
22	30	33	N E	N E		2	29 62	29 50
23	35	39	N E	E		2	29 51	29 27
24	31	34	NW	N W	2		29 45	29 57
25	30	37	W	W	2		29 54	29 47
26	34	32	W	N W	2		29 25	29 33
27	20	27	NW	N W	2		29 48	29 45
28	22	30	W	N W	2		29 45	29 43
29	26	34	W	N W	1	1	29 59	29 41
30	24	30	NW	N W	2		29 54	29 56

Results of Meteorological Observations for November, 1797.

Mean temperature of the Thermometer at fun-rife, deg. 35 16 hund.
Do. do. of the do. at 2 P. M. 42 58
Do. do. for the whole month, 38 87
Greateft monthly range, between the 3d and 18th, 49 0
Do. do. in 24 hours, between the 14th & 18th, 22 0
Six days it rained, and a very large quantity has fallen.
One day it fnowed, and 4 inches have fallen.
Coldeft day the 18th. Warmeft day the 3d.

METEOROLOGICAL OBSERVATIONS *for December*, 1797.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. S. r.	2 P.M.	Clear.	Cloudy.	Barometer observed at Sun-rise.	2 P. M.
1	24	31	W	N W	2		29 74	29 75
2	28	29	W	E		2	29 76	29 67
3	30	35	E	N E		2	29 67	29 57
4	36	26	N W	N W		2	29	29 18
5	10	20	W	W	2		29 63	29 64
6	21	27	W	W	2		29 77	29 77
7	24	37	W	W		2	29 68	29 49
8	30	37	W	W		2	29 31	29 29
9	29	35	W	N W	1	1	29 30	29 32
10	24	30	W	W	2		29 72	29 80
11	21	28	W	W	2		29 96	29 75
12	32	38	W	W		2	29 60	29 53
13	40	44	W	N W		2	29 80	29 80
14	42	49	N W	N W	2		29 59	29 58
15	39	39	N E	N E		2	29 52	29 38
16	32	34	N W	N W	2		29 49	29 70
17	28	34	E	S W	1	1	29 91	29 79
18	32	31	W	W	2		29 58	29 63
19	14	23	W	S W	1	1	29 90	29 88
20	24	32	S W	S W	1	1	29 49	29 34
21	5	13	N W	N W	2		29 55	29 64
22	8	13	W	W		2	29 82	29 80
23	11	24	W	N W	2		29 97	29 99
24	12	26	N W	S W	2		30 10	30 6
25	26	34	N W	N W		2	30	29 90
26	36	41	N W	N W	1	1	29 60	29 63
27	16	19	N E	N E	2		29 88	29 89
28	1	16	N	N	2		29 90	29 82
29	11	25	N	N E	2		29 92	29 90
30	16	33	N	S	2		29 93	29 89
31	21	34	N W	N W	2		29 94	29 96

Results of Meteorological Observations for December, 1797.

Mean temperature of the Thermometer at sun-rise, deg. 23 3 hund.
Do. do. of the do. at 2 P. M. 30 22
Do. do. for the whole month, 26 62
Greatest monthly range, between the 13th and 28th, 43 0
Do. do. in 24 hours, 20th and 21st, 27 0
Three days it rained, and a considerable quantity has fallen.
One day it snowed, and about half an inch has fallen.
Coldest day the 28th. Warmest day the 13th.

A TABLE *of Patients admitted into the New-York Hospital, from the 1st of October, 1797, to the 1st of January, 1798; shewing the Disease for which each was received, with the Event of the Case.*

MEDICAL *Patients admitted in October.*

DISEASES.	No.	Cured.	Reliev.	Died.	Remain under Care.	Result.	
Dysentery	1	1					
Intermitting Fever	4	3			1		
Enteritis	1				1		
Syphilis	3	2			1		
Ascites	2	1			1		
Rheumatism	6	2			4		
Diarrhœa	2	1			1		
Palsy	1			1			
Mania	1				1		
Pneumonia	1				1		
Gonorrhœa	3	1			2		
Apoplexy	1				1		
Anasarca	1				1		
Catarrh	1				1	Received	46
SURGICAL.							
Wound	2	1			1	Cured	16
Syphilis	5	2			3	Relieved	1
Sore Legs	7	2	1		3&1e.	Died	1
Catarrh	2				2	Eloped	1
Opthalmia	1				1	Remain	27
Contusion	1				1		—46

November.	MEDICAL.					
Rheumatism	4	1			3	
Anasarca	3			1	2	
Diarrhœa	2	2				
Pneumonia	3	1		1	1	
Dyspepsia	1				1	
Gonorrhœa	3	2			1elop.	
Syphilis	4	2			2	
Mania	1				1	
Intermittent Fever	2	1			1	

SURGICAL.

DISEASES.	No.	Cured.	Relieved.	Died.	Remain under Care.	Result.	
Sore Legs	10	2	1		7	Received	44
Bruise	2	2					
Syphilis	5	1			3&1e.	Cured	15
Tumor	2	1			1	Relieved	1
Lumbar Abscess	1				1	Died	2
Fracture	1				1	Eloped	2
						Remain	24
							—44

December. MEDICAL.

Syphilis	6	2			4		
Rheumatism	6	2			4		
Diarrhœa	4	3			1		
Pulmonary Consumption	1				1 dis.		
Ascites	1				1		
Pneumonia	8	3			5		
Catarrh	5	2			3		
Gonorrhœa	2	1			1		
Amenorrhœa	1				1		
SURGICAL.							
Sore Legs	10	2	2		6	Received	58
Frozen Feet	6				6		
Syphilis	5	1			4	Cured	16
Fracture	1				1	Relieved	2
Fistula in Ano	1				1	Discharged	1
Burn	1				1	Remain	39
							—58

SUMMARY.

Patients received into the New-York Hospital from the first of October, 1797, to the first of January, 1798, exclusive of those then remaining under care, 148

Of this number have been *cured*,	47
relieved,	4
died,	3
eloped,	3
disorderly,	1
remaining under *care*,	90
	148

A RETURN *of Patients admitted to the Care of the New-York City Dispensary, from the 1st of Oct.* 1797, *to the 1st of Jan.* 1798.

OCTOBER.

DISEASES.	No.	Cured.	Reliev.	Died.	Removed to the Hospital.	Result.	
Tumor Mammæ	1	1				Received	36
Hypochondriasis	1	1					—
Piles	1	1				Cured	31
Venereal Disease	4	3			1 u. care	Relieved	1
Luxation	1	1				Died	1
Rheumatism	4	4				Removed	
Catarrh	2	2				to the	
Pneumony	5	4			1 Hos.	Hospital	1
Clap	1	1				Under care	2
Eruption	1	1					—36
Remitting Fever	2	2					
Cough	2	2					
Bifid Spine	1		1				
Worms	2	2					
Vomiting of Blood	1	1					
Indurated Tumor	1				1 u. care		
Small-pox Confluent	1			1			
Costiveness	1	1					
Itch	1	1					
Fracture	1	1					
Pain of the Side	1	1					

NOVEMBER.

Dysentery	1	1				Admitted	19
Worms	1	1					—
Costiveness	1	1				Cured	16
Prolapsus	1	1				Relieved	1
Ulcer of the Leg	1	1				Died	2
Pain of the Side	1	1					—19
Diarrhœa	3	3					
Scald Head	1	1					
Venereal Disease	3	3					
Dropsy	2			2			
Small-pox	1	1					
Hysterics	1	1					
Cough	1	1					
Palsy	1		1				

DECEMBER.

DISEASES.	No.	Cured.	Relieved.	Died.	Removed to the Hofpital.	Result.	
Small-pox	5	4		1			
Hectic Fever	1				1		
Consumption	4				4 u. care		
Indigestion	2				2 do.		
Parturition	3				3 deliver.		
Venereal Disease	1				1 u. care		
Scald Head	1	1					
Dysentery	1	1					
Typhoid Fever	9	9					
Pneumony	1	1					
Fluor Albus	1	1					
Scrophula	1				1 u. care	Admitted	46
Sore Legs	4				4 do.		—
Atrophy	1	1				Cured	24
Inflammation of Eyes	1	1				Died	1
Worms	3	3				Removed	
Erysipelas	1				1 u. care	to the	
Cough	1				do.	Hospital	1
Catarrh	1				do.	Under care	20
Wound	1				do.		—46
Canker of Mouth	1				do.		
Rheumatism	1				do.		
Chilblains	1				do.		

SUMMARY.

Whole number of Patients admitted into the New-York City Dispensary from the 1st of Oct. 1797, to the 1st of Jan. 1798, 101

Of this number have been *cured*, ...	71
relieved, ...	2
have *died*, ...	4
Removed to the Hospital, ...	2
Remain under care, ...	22
	101

SUMMARY.

Whole number of Patients admitted into the New-York City Dispensary from the 1st of Jan. 1797, to the 1st of Jan. 1798.

Admitted,	462
Cured,	384
Died,	18
Relieved,	18
Removed to the Hospital,	10
Country,	2
Eloped,	3
Disorderly,	1
Under care,	26
	462

HUGH M'LEAN.

City Dispensary, January 1, 1798.

MEDICAL NEWS.

DOMESTIC.

IN the *Second Number* of the REPOSITORY, we gave some account of an epidemic disease among CATS, which has prevailed very extensively in the United States. Since the publication of that number, we have received the following additional information.

The *cat-distemper* appeared in Hartford, Connecticut, about the last of July or first of August, 1797, where it is supposed to have carried off the greater part of these animals in that city. The symptoms which it exhibited there, of which we have obtained no very satisfactory account, resemble those noticed in New-York. It is not known whether the disease extended to the neighbouring towns. But it was observed at Poughkeepsie, in this State, towards the last of November.

From a Bourdeaux paper of October 24, it appears that France has been visited by a similar epidemic. One of the Health-officers had opened the body of a *cat* to discover the cause, and found in it a knot of worms: where, is not mentioned, nor is any important information added to what is already known to us.

Some time in October last, the town of New-Hartford, Connecticut, was alarmed by the sudden appearance of *hydrophobia*, or canine madness, among the DOGS of that place. Several persons are said to have been bitten by dogs supposed to be mad. The alarm which this occasioned was so considerable as to induce the magistrates of the town to exert the authority vested in them, by a law of the State, for the confinement of all the dogs. This law inflicts a penalty of seven dollars on all persons suffering their dogs to go at large; and permits the animals to be killed, if seen abroad. Shortly after, the *rabies* appeared among the dogs of Suffield, another town of Connecticut; and the present number of the Repository contains the melancholy history of a child who died in that place, in consequence of the bite of a rabid animal. The magistrates of Suffield have also enforced the statute against dogs. Similar steps have been taken in Hartford and New-Haven, where this disease has also broken out in the canine species; and where its extensive prevalence is very much apprehended. In the mean time, the disease has appeared in the neighbouring parts of Massachusetts, and has proved fatal to a child in West-Springfield, in

that State; notwithstanding an immediate course of mercury was entered upon, and pursued to complete salivation. We also observe by the newspapers, that several children, as well as dogs, have been bitten at *Salem;* but as there are several places of this name, (in Massachusetts, Connecticut, New-York, &c.) we are uncertain in which of them this event happened.

We have the pleasure to inform our readers and the public, that an intelligent and vigilant physician of Hartford, Connecticut, is observing the progress of this new and terrible epidemic, in that part of the country; from whose labours we hope to derive correct and extensive information, on this very interesting subject.

Dr. Mitchill has received a letter from a physician of New-Jersey, containing the following circumstances concerning canine madness. A dog belonging to the physician himself was affected with this disease, which assumed the following appearances—it began with inflamed eyes and disturbed mind—a spasmodic rigidity soon invaded one of the fore legs, the part bitten, and gradually proceeded to the other limbs, and the trunk of the body—the symptoms of hydrophobia did not appear till the day before his death. Alkalies were given to this dog, with manifest alleviation of the smptoms.

The physician traced the disease to the first dog known to be affected in the country where he resides: this dog had been feeding upon some putrid dead bodies of animals, soon after which he was observed to be sick, and to eject from his stomach the matters eaten. This dog bit two cows and a colt, on the farm to which he belonged; one was a milch cow, and was observed about 40 days after being bitten, to vomit a greenish matter when she was milked, and this happened twice before she turned mad. This matter, on examination, was found not to be the cud. The milk was used without injury. The colt was taken mad about 50 days after being bitten, and the other cow at a somewhat longer period. The above dog took his route through Elizabeth-town, and proceeded northward as far as Second River, and then returned to Newark, where he was killed. In this course he bit many animals, all of which died before the cows and colt above-mentioned. The physician also mentions three cases of cats bitten, all of which exhibited symptoms of delirium, puking of greenish bile, &c.

The same physician has also collected observations of farmers in his neighbourhood, relative to the difference of result in fat and lean hogs bitten by a rabid animal. The fat hogs escaped without injury, but on the lean ones the poison exerted all its worst effects. A lean hog was bitten on the upper part of one of the thighs, which immediately became violently inflamed, and soon mortified: this hog lived but one day after the bite, and remarkable purple appearances were discovered on the body after death. It is ob-

served also by the same gentleman, that among a number of animals some time ago bitten by mad dogs, none escaped except one cow, who had greedily devoured two quarts of common salt. The reader will remember that the probable usefulness of volatile alkali in case of canine madness, was mentioned in the Medical Repository, No. I. p. 87. If any other cases of this disease should have occurred to any other of our readers, attended with remarkable circumstances, the communication of them is requested.

In our last number, we made mention of a CALF whose *heart* was very singularly placed. Since then, the animal having died, there has been opportunity to examine, and conclusively determine that it was really the heart. By some misapprehension of the keeper, the gentleman who designed to have made a minute anatomical examination of the heart and surrounding parts, was not apprized of the death of the creature, till after the keeper had removed that viscus from its situation. It was therefore impossible to make such an examination as was intended. On inspection, there appeared nothing remarkable in the heart itself, but its *figure;* which bore some resemblance to a work-bag, while that part which is usually denominated the base, was, in this instance, the smallest.

CALVIN PHILIPS, a remarkable dwarf, has been exhibited as an object of curiosity, to several thousand spectators in this city, during the course of last December. He is seven years old, between 26 and 27 inches high, and his weight, as taken in the course of the last autumn, was 12 pounds, including his clothes. His figure, thus dimunitive, displays a pleasing and elegant proportion; and his face, though thin and long, is made up of regular and agreeable features, corresponding to his age rather than size, and indicating a degree of maturity, in point of evolution, much beyond his years. His complexion and hair are light, his eyes blue, and his general aspect delicate. The palms of his hands and soles of his feet have acquired much of the hardness, and the former are a good deal marked with the lines, belonging to adult age. On inspection of his body, undressed, no deformity or deficiency could be discovered; but, on the contrary, the utmost completeness and symmetry of every part. He is active, playful, sprightly, and very irascible. In general, he is averse to any minute examination of visitors; and is commonly occupied in the sports of children, to which he is devoted in a remarkable degree. His voice is shrill, and less articulate than common at his age. His mental attainments appear to fall rather below the ordinary standard, at his age.

In his travels as a public spectacle, this dwarf is superintended

by his maternal grand parents. The grand-father is a large and robust man, aged 56 years; the grand-mother is about the middle size, and aged 54. Both of them are now in good health, and have generally been so throughout their lives. These persons give the following account of their grand-child.

They state that he was born at Bridgewater, Massachusetts, on the 14th of January, 1791; that the father of the child is of the common size, the mother rather above it; the former 24, the latter 26 years of age when the child was born, and both of good health and sound constitutions—that these parents had two children before this dwarf, and three since, all of them healthy and of usual size, and of whom four still survive—that all the circumstances of gestation and parturition were natural—that the child was so small at birth, as to be supposed scarcely to weigh two pounds; his thigh not exceeding the thickness of a man's thumb, and his whole hand readily covered by a cent—that his mother often carried him in her bosom, while engaged in spinning—that, notwithstanding this diminutiveness, he shewed all the marks of a lively and healthy child, particularly that of good appetite—that he was exempt from all the diseases of early infancy, and has enjoyed good health ever since, except the hooping-cough last spring, which was very favourable, and being once disordered with worms—that he was weaned at seven months, began to creep at nine months, and to run about at eighteen months, without pain or difficulty, and has since had the common number, two of which are already shed—that, from the birth till two years old, he grew very slowly, afterwards more perceptibly till five, and since that period, for the last two years, has altogether ceased to grow; which is ascertained by weight, and by the size of his clothes worn two years ago—that, on his ceasing to grow, the change with respect to the hardness of the palms of his hands and soles of his feet, soon took place—that he was upwards of four years old when he began to speak, and has rapidly improved in this respect within the last year—that he never learned but a few letters of the alphabet, which were acquired some time ago, and are now nearly forgotten—that since weaning, he has been always fed upon the common articles of diet given to children; he eats moderately, but sufficiently; and is particularly fond of fruits and cyder—that he never was in the habit of drinking any kind of distilled liquor—that he sleeps in an easy and natural manner, generally goes to bed about seven o'clock, and continues to repose till four or five in the morning, but never sleeps in the day—that he never suffered any injury by blows, falls, or any other accidents—and that, finally, they are unacquainted with any cause to which his diminutive size may be ascribed.

From some circumstances in his behaviour, it has been sus-

pected that he discovers some degree of sexual propensity; and it is possible, this suspicion may be thought to derive countenance from the appearances of his face, hands, and feet, already mentioned, as well as from the extreme reserve and obstinacy with which he opposed any minuteness of inspection, while he was undressed.

It is difficult to pronounce concerning his intellectual capacity. To infer imbecility from a few uncertain and equivocal appearances, would be consistent neither with reason nor justice. On account of his figure, little attention has been bestowed in the cultivation of his understanding; the opinion that his mental and personal dimensions were alike small, has shut the avenues of instruction; and his situation in a variety of respects has been unfavourable to improvement. It is probable his present more enlarged intercourse with society, aided by any well directed exertions to educate him, will soon be sufficient to ascertain the comparative powers of his mind.

We are happy to be able to inform our readers, that Mr. Webster's valuable *Letters to Dr. Currie*, will be collected and published by the author very shortly; and that many new, extensive, and very important additions will be made, illustrative and confirmative of the principles advanced, and ably supported in the original letters.

A new Medical Association has lately been formed in Philadelphia, whose more particular object is to inquire into and elucidate the history and nature of pestilential diseases; without excluding attention to other subordinate objects. This association, which takes the name of *The Medical Academy of Philadelphia*, design to publish the result of their labours periodically. Their publications, it is expected, will consist of a semi-annual octavo volume; and the important subjects to which the attention of the members will be steadily directed, induce us to believe that they will receive that extensive encouragement, which, from the reputation of the gentlemen concerned, we may confidently pronounce they will amply merit.

Dr. Adam Kuhn has resigned the Professorship of the Practice of Medicine, in the University of Pennsylvania. A successor has not hitherto been appointed.

A valuable addition has been made to the store of medical instruction in Philadelphia, in the present season, by the institution of a regular and extensive course of *Obstetrical Lectures*, by Dr. William Dewees.

Dr. Rush is preparing for publication, a fifth volume of his "Inquiries and Observations." This volume, we are informed, is to contain two dissertations—on the Gout, and on Diseases of the Mind—and a History of the Yellow Fever for 1797.

Dr. Barton, the intended publication of whose Journal of a Tour through a part of the States of New-York and Pennsylvania, was announced in the second number of the Repository, designs first to publish a Memoir on the *Bronchocele*, or on Goitres, as observed in the State of New-York. This Memoir, which is in great forwardness, may be speedily expected. Dr. Barton's Journal will appear in the course of the ensuing spring or summer.

We are informed, that a work is soon to make its appearance, from Dr. Currie, of Philadelphia, on Bilious Remitting Fevers.

Mr. Thomas Brufe, sen. of Chestertown, Maryland, advertises Patent Instruments for *extracting teeth in a perpendicular direction*. His advertisement is accompanied with certificates, in favour of his instruments, from Doctors Shippen, Wilkins, and Goodwin. From the known talents of these gentlemen, there is great reason to expect much from this improvement in the operation of tooth-drawing.

It appears from a Charleston paper, that Dr. Ramsay has presented to the Medical Society of South-Carolina, a Memoir on the Autumnal Epidemic or Yellow Fever of Charleston. The opportunities which Dr. Ramsay must have had for observing this disease, lead us to expect that much valuable information will be found in this memoir. But, hitherto, we have not been able to learn, whether it has been made public by the society or the author.

FOREIGN.

IT appears from the Foreign Journals, that a Comet (which may be the same that was observed in America, by Mr. Merrick. See *News*, Medical Repository, No. II.) has been seen both in France and England: in France, by Citizen Bouvard, August 14; in England, by Miss Caroline Herschell, and Mr. Lee of Hackney, on the same night; by Mr. Capel Loft and Mr. Walker, August 18, 19, and 20; and by an anonymous observer, August 26. We have no further mention of this phenomenon in the United States.

Mr. Hodgson, printer of the *Newcastle Chronicle*, states, on the authority of a gentleman who has seen various experiments made, that Mr. Robson, tanner, in Newcastle, has discovered a method for ascertaining the quality of oak bark, so as to enable any person to estimate its intrinsic value, by finding the real quantity of essence it contains, in a few hours, without being deceived by its appearance. *Monthly Magazine, August*, 1797.

Mr. Van Marum, superintendant of the Teylerian institution at Haarlem, has discovered, that a piece of phosphorus, wrapped in a little cotton, and placed under the receiver of an air-pump, inflames spontaneously, when the air is exhausted to a certain degree, and continues to burn till it is consumed. It is singular, that this combustion should commence and continue in air, rarified to a degree that would immediately extinguish any other burning material. Mr. Van Marum explains this phenomenon by supposing, that the cotton which surrounds the phosphorus (for a piece of phosphorus placed in similar circumstances, but not enveloped with cotton, does not inflame) accumulates the caloric, or matter of heat, in its immediate neighbourhood, while, at the same time, the exhalations which phosphorus is constantly giving out when exposed to the air, can no longer rise, on account of its rarity, and thus the temperature is elevated to the degree at which phosphorus combines with the oxygene of the atmosphere, and inflammation takes place. This combustion was found to take place in air that had only $\frac{1}{300}$ of the density of the common atmosphere. It is certainly very singular, that the small portion of oxygene that could remain in air so rarified, should be adequate to support the combustion of the phosphorus; and that it was a real combustion, is proved by the diminution in weight of the phosphorus, as well as by the quantity of phosphoric acid formed and found on the plate of the air-pump. [*Monthly Magazine, Sept.* 1797.

Account of certain Memoirs published by the Polytechnic School at Paris. Extracted from NICHOLSON'S JOURNAL, *No* III.

IT has long been known, that the sulphure of pot-ash attracts the oxygene of the atmosphere, and separates it from the azote with which it is combined. Attempts were consequently made to construct eudiometers with this sulphure, in imitation of Scheele; but none of these gave the result with the requisite speed and accuracy. Guyton discovered, that by heating the sulphure, the combination is made instantly. He therefore advises to take a small retort filled with water, to place therein a small piece of sulphure, then to introduce the air and heat with a taper, to that place on which the sulphure rests. The absorption of the oxygene is immediately made, and the desired result ascertained.

By this invention, which contributes to the accuracy and value of an instrument greatly used in meteorological observations, Guyton has rendered a real service to philosophers.

Gottling had maintained, in a memoir published in Gren's Journal, that phosphorus burns in azotic gas, forms an acid by this combustion, and does not burn in oxygenous gas. Berthollet made several experiments on the combination of phosphorus with different gases. He found, 1. That the phosphorus does not combine with oxygene at the ordinary temperature, but requires a more elevated temperature to produce combustion. 2. That phosphorus is soluble in the azotic gas; and that, by means of this solution, it burns with oxygenous gas at the ordinary temperature, and appears luminous in the dark.

By means of these experiments, Berthollet explained the extraordinary phenomena which Gottling, Lemps, and Lampadius had observed; and he imagined, that phosphorus might be used to measure the quantity of oxygene gas contained in the air of the atmosphere, or any other gas containing azote.

This new eudiometer has an advantage over other instruments of the same nature, by shewing the precise instant of the total absorption of oxygene, which happens when no more white vapour is seen in the day light, nor light in an obscure place; but it has likewise the inconvenience of requiring the presence of a quantity of azote sufficient to dissolve the phosphorus readily before its combination with oxygene.

Clouet had published in a memoir, that the prussic colouring principle might be obtained by passing ammonical gas through ignited charcoal. The experiments related by Bonjour, in the third cahier of the Journal of the Polytechnic School, consist merely of the processes he made use of, and the trials he made in the presence of Clouet, to verify the phenomenon he had announced, and which, after a most careful examination, proved to be in every respect agreeable to the account which was published.

It was formerly observed, that snow preserves the vegetative power, and that rain accelerates the growth of plants more than artificial waterings. Hassenfratz has inquired, in his memoir, into the cause of these comparative effects. He shews, from several experiments, that the preserving power of snow arises from two circumstances; its imperfect conducting power, and its oxygenation. This philosopher has proved, that snow is water oxygenated and converted into the solid form. He has also shewn, that rain is more oxygenated than any other water, and that a large portion of its good effects is to be attributed to this circumstance.

The Memoir on the Arts is written by Chaussier. Its object is to describe the composition of a liquor proper to be substituted

instead of wine lees in fulling, to obtain the greatest effect with the most facility and economy.

The liquor indicated by Chaussier, is a small quantity of sulphuric acid. This acid bath, which experience has assured him may be used with invariable success, likewise affords the advantage of obtaining a very white colour in hats, because the felt does not become coloured in the working.

Mr. Sheldrake, truss-maker, of the Strand, London, has lately obtained a patent for several new invented trusses, which, from the account given of them, promise to be of very great importance in removing various disagreeable and even dangerous deformities; such as *club feet*, the *wry neck*, *incurvated spine*, &c. An intelligible account of his trusses cannot be given without the aid of plates; but such persons as feel a particular interest in this subject, are recommended for further information to "the Monthly Magazine" for September last. As an evidence of their utility, we subjoin the following opinion of Mr. Ford, the respectable author of an excellent treatise on the Disease of the Hip-Joint. It relates to the case of a child, with feet very much distorted; which, having been admitted into the Westminster Dispensary, was afterwards referred to Mr. Sheldrake.

"Mr. Ford presents his compliments to Mr. Sheldrake, and has "great satisfaction in seeing the child of Mr. Wells, who appears "to him perfectly cured of the distortion in his feet."

"*Golden-Square.*"

After the preceding title was sent to the press, the two following articles were received from the Rev. Dr. Morse, of Charlestown, (Massachusetts) in a letter to Mr. Smith. The first is a printed paper, which appears to have been taken from some British periodical work. The second is a copy of a letter from Dr. John Brickell, of Savannah, to the Selectmen of Boston. The want of time to give any other form to these communications; the importance of circulating the earliest information on this subject to those parts of the country which are most immediately exposed to the ravages of rabid animals; and the higher authenticity which facts derive from the signature of the original observers; will, we trust, excuse us both to Dr. Morse and Dr. Brickell, for having, in some degree, deviated from the line of conduct they wish us to pursue, in respect to these papers. We agree with Dr. Morse, that it is to be regretted that "Dr. Brickell "had not left us to infer that the dogs that bit his patients were "really mad;" and that "if he had stated the fact that they ac- "tually died of the disease, or that the animals or persons bitten "by them, and to whom his remedy was not applied, had actually "received the infection, his communication would have been more sa- "tisfactory."

SYMPTOMS OF MADNESS IN DOGS.

MR. Meynell, of Quorndon, in Leicestershire, has paid great attention to this disorder among his dogs, and has readily communicated the result of his accurate observations.

The first symptom of canine madness in dogs, is, I believe, a failure of appetite in a small degree. I mean, that the dog does not eat his usual food with usual eagerness; though, if better food be offered him, he may eat it greedily. A disposition to quarrel with other dogs comes on early in the disease; a total loss of appetite generally succeeds; though I have often seen dogs eat and lap water the day before their death, which generally happens between seven and ten days after the first symptom has appeared. A mad dog will not, I believe, cry out on being struck, or shew any sign of fear on being threatened; though he will, very late in the disease, appear sensible of kind treatment.

I have never known a mad dog shew symptoms of the disease in less time after the bite than ten days; and I have known many instances of dogs having died mad, as late as eight months after the bite. I think the symptoms generally appear between three and eight weeks after the bite.

A mad dog, in the height of the disorder, has a disposition to bite all other dogs, animals, or men. When not provoked, he usually

attacks only such as come in his way; but having no fear, it is peculiarly dangerous to strike at, or provoke him.

Mad dogs appear to be capable of communicating the affection early in the disorder, and as soon as they begin to quarrel with or bite other dogs. The eyes of mad dogs do not look red or fierce, but dull; and have a peculiar appearance, which is easily distinguished by such as have been used to observe it; but not easily to be described.

Mad dogs never bark, but occasionally utter a most dismal and plaintive howl, expressive of extreme distress; and which, they who have once heard, can never forget, so that dogs may be known to be going mad, without being seen, when only this dismal howl is heard.

Mad dogs do not foam or froth at the mouth, but their lips and tongues appear dry and foul or slimy.

Though mad dogs generally refuse both food and drink in the latter stage of the disorder, yet they never show any abhorrence or dread of water; will pass through it without difficulty, and lap it eagerly to the last; but it is remarkable, though they lap water for a long time, and eagerly, and do not seem to experience any uneasiness from it, yet they do not appear to swallow a single drop of it; for however long they may continue lapping it, no diminution of quantity can be perceived.

I am persuaded, that this disorder never originates from hot weather, putrid provisions, or from any other cause but the bite; for, however dogs may have been confined, however fed, or whatever may have been the heat of the season, I never knew the disorder to commence without being able to trace it to that cause; and it was never introduced into the kennel but by the bite of a mad dog.* The hair of a mad dog does not stand erect more than that of other dogs. I do not know that there is any thing remarkable in a mad dog's carrying his head or his tail. I do not believe that dogs are more afraid of a mad dog, than they are of any other dog that seems disposed to attack them.

There are two kinds of madness, both of which I have known to originate from the bite of the same dog. Among huntsmen, one is known by the name of raging, the other by that of dumb madness. In dumb madness the nether jaw drops, and is fixed; the tongue hangs out of the mouth, and slaver drops from it. In raging madness, the mouth is shut, except when the dog snaps or howls; and no moisture drops from it.

We have thus presented to our readers, in Mr. Meynell's own words, his principal remarks respecting the signs of rabies in dogs.

* This can not be true in the extent here supposed.—On this supposition, how could the disease appear in a new country? How could it originate at all? What first occasioned, may occasion it a second time. *Editors.*

These, we apprehend, if properly attended to, will afford more exact and more authentic information, than has hitherto been given concerning it.

While they serve to correct mistaken ideas which have generally prevailed, drawn from supposed appearances which have no existence, they, at the same time, point out sufficient marks by which this affection in dogs, even at its commencement, may be distinguished. And whenever a failure of appetite and an uncommon disposition to quarrel with other dogs appear, the animal should certainly be secured as soon as it can with safety be effected. If these symptoms be the first stage of this disorder, the dulness of the eyes, the want of barking, and the dismal plaintive howl will soon characterize the disease; and thus accidents of the most dreadful and melancholy nature may be prevented.

TO THE SELECTMEN OF BOSTON.

ACTUATED by a love for you and all my other fellow mortals, (children of the same parent) I take the liberty of communicating a method of preventing any bad effects from the bite of a mad dog: as I perceive, by the perusal of newspapers, that some fatal instances of hydrophobia have happened in your State. The method is to *wash the bitten part with* 20 *or* 30 *kettles full of water, poured from the spout of the kettles, or a mug; and afterwards to burn the wound as deep as the bite has penetrated, with the end of a case knife, or any other iron made nearly red-hot.* The washing is to carry away, from in and around the bite, the saliva, (in which the infection exists); and the burning is to extirpate any infected part. In washing, I hold the kettle high over the bite, that the force of the descending stream may act with the more effect. The ancient method was cutting out or burning; but washing escaped them.

I published the above, several years ago, in the Savannah Gazette; but its limited circulation prevented it from being extensively known.

The remedy having being often applied, in Georgia, without once failing, is a favourable circumstance.

On perusing, some years ago, the annual publications of Dr. Duncan, of Edinburgh, which consist chiefly of medical information sent to him, by men of science, from all parts of the world; I observed two cases reported of persons bit by a mad dog, being directly carried to a surgeon, who immediately cut out the bitten parts; notwithstanding which, they both died in hydrophobia. The doctor subjoins a melancholy question, whether the infection is of a nature so tenacious, as not to be extirpated by any means, when a person is bitten by a dog *really* mad? and intimates a sus-

picion, that in the cases recorded of people being bit, and escaping the hydrophobia by medical aid, the dogs were not *really* mad, or had not the *rabies*.

Sentiments of this kind, coming from an authority so great, set me to thinking on the subject; and, with the more earnestness, as we were alarmed by a report of mad dogs being in the State. It is observable, that mad dogs have frequently abundance of saliva about their chops, which, of course, will be spread on and round their bite—and that the virus is in the saliva.

It therefore occurred to my thoughts, that the surgeon's knife (in the above cases) in cutting, carried into the incision part of the saliva from the surface, and planted anew the disorder, as the lancet plants the small-pox, in inoculation.

A little time furnished an occasion for putting my reflections to the test. Three persons were bitten, one a negro girl of my own, on the naked foot. I applied the washing with all possible speed—afterwards the hot iron or cutting, as they preferred. After the lapse of a length of time sufficient to convince me that they were out of danger, I had the cure published in our Gazette, in which, however, I only mentioned washing and burning, which any person can apply; as cutting sometimes requires the hand of an anatomist.

I took an early opportunity of writing to Dr. Duncan on the subject; likewise of making it known in London and other places; and sent it by an official conveyance to Paris; where I observe, the government had it published under the denomination of a *decret d'instruction*, with this improvement, that *spirit of nitre* poured into the bite, would destroy the parts as effectually as burning.

If the simple and plain remedy here proposed is already known among you, the motive which prompted me to give this trouble, will, I hope, plead my apology; but if I should be instrumental in averting a calamity the most direful, terrific, and humiliating; a disorder which deranges the faculties of the wisest, and converts the mildest man into a fiend in appearance; I shall feel myself fully rewarded, in so far *doing my duty to my neighbour*.

I will just remark, that in all the cases which have come under my care, the washing was applied in less than an hour after being bitten; and the hot iron as soon as possible after. And without doubt, the sooner the applications are made, the better is the chance of escape.

Should it be thought adviseable to give this, or any part of it, to the printer for publication, my name need not be mentioned, as it has already appeared in our gazette on this subject.

I am, Gentlemen, with kind wishes,
Your friend and fellow-citizen,

Savannah, Georgia, Oct. 15, 1797. JOHN BRICKELL.

My highly esteemed friend Dr. Morse, whose profession and chief pleasure is doing good, will be so kind as to introduce me on this occasion, to the guardians of the city, as I have not the honour of a personal acquaintance among the worthy gentlemen.

His sincere friend,

JOHN BRICKELL.

APPENDIX.

DOMESTIC.

ARTICLE I.

The Report of the Commissioners of Health to the Mayor and City Council of Baltimore, consisting of facts and communications relative to the health of the city, since their appointment, and especially during the late prevailing sickness.

ON the 5th of June, the commissioners formed a full board, and proceeded to the business of their appointment, having been previously qualified according to law before the mayor. Their office requiring them to watch over, and preserve the health of the city, their first concern was to guard against the introduction of contagious diseases by importation. For this purpose, having appointed Conrad Smull, a suitable person, to take charge of the hospital on Hawkins's-Point, provided a boat and boatmen to attend on the health-officer, and for keeping up a communication between Hawkins's-Point and the city, and formed regulations for the government of the board—they gave such directions to the health-officer respecting the examination of all vessels coming from beyond the seas, as appeared necessary.

Nothing occurred to give the least uneasiness to the inhabitants, till towards the latter end of June, when Messieurs Parkin and M'Kenna, two young men who occupied a warehouse in South-street, were near one time seized with a disorder highly inflammatory, and which put a period to their existence in a few days. This circumstance occasioned some agitation in the minds of the citizens, and a report prevailed that their complaint was the yellow fever, and had proceeded from some putrid matter stored, or contained in their warehouse. A meeting of the board was called on this subject, and they attended personally, with several of the faculty, and examined every part of the said warehouse, and found nothing therein that could be the least injurious to health, it being in as clean and wholesome a state as any warehouse in the city. From what cause their complaint originated, is not for them to say, but leave it for those who may be more capable to determine; yet no discovery was ever made of any infection having been caught

from them. The board, nevertheless, apprehending that there might be some causes existing in some parts of the city, which in the course of the hot season then approaching, might prove fatal to the health of the inhabitants if not removed, concluded to go through the city, east and west, and examine every part, and represent to the mayor, all nuisances and offensive substances discovered by them, that the same might be removed in the manner the ordinances direct.—This disagreeable and laborious task they accomplished in about one week.

Their attention was then turned to guard against the importation of damaged hides, coffee and other damaged goods, and regulations were made concerning them. A greater strictness was also deemed necessary respecting the arrival of vessels from the West-Indies. An order was therefore published by the board, commanding all vessels from the islands to stop at or below the Fort ten days, and until permitted by the health-officer to proceed into port:—The same order extended to vessels coming from all other suspected places. A malignant fever about this time prevailing in Philadelphia, occasioned the board to provide a house on the road, a small distance from the city, to accommodate travellers from that place, in case it should be found proper to stop the communication between the two cities, which, however, was not deemed necessary.

July had passed, and August was ending, while the citizens of West Baltimore enjoyed unusual health. Many nuisances had been removed, and some low and sunken places had been filled up, in consequence of the report made by the board to the mayor; the streets were also kept cleaner than usual, and the healthiness of that part of the city was a common topic of conversation. In East Baltimore, (or Fell's-Point) on the contrary, it was somewhat different. A bilious complaint had early commenced, and appeared gradually progressing to a worse stage; yet no alarm had been excited, as it was supposed to be no other than the common sickness of the season; but the attention of the board was soon called to notice more particularly, the state of that part of the city.

On the 26th of August, a rumor began to be spread in West Baltimore, that the sickness at Fell's-Point was somewhat more than common. The chairman of the board immediately addressed a letter to each of the physicians in that part of the city, requesting them to inform the board, whether any case of contagious disease had come under their notice, and of the general state of the health in that district. Whereupon the following communications were received:—

Mr. ADAM FONERDEN, *Chairman of the Board of Health.*

SIR,

I AM favoured with yours of this morning, and hasten to give you all the satisfaction my judgment and experience will serve. Ever since the third week in June, I have observed in my district of practice, a particular species of fever becoming epidemic, affecting all ages, sexes and colours; but more particularly confined to that class of people who labour hard and exercise violently in the heat of the sun, live intemperately, or who imprudently expose themselves to the night air, by lying down in it after returning from work.—This is a very dangerous fever, and where its commencing symptoms are violent in degree, almost certainly fatal, if not early encountered with powerful remedies. From the frequent calls we have in all directions, it seems to be pretty generally diffused, and assumes to itself the sole government of our sickness. The number of sick, however, seems stationary. During the wet weather in the last of July and first of this month, it yielded for near two weeks to the dysentery, which has now decreased, and the usual epidemic again prevails. I have always been cautious of exciting any unnecessary alarm in the city; and while the fever is so manageable, and the deaths so inconsiderable to the number of sick, I am strengthened in the propriety of this conduct.—I have called it an epidemic, in contradistinction to an imported contagion, and because, if it is contagious, it is in the locality of our atmosphere, the source of which I can perceive in every ten steps I take in our streets; ponds of stagnant water, and sinks of putrid animal and vegetable matters, exhaling perpetually under a hot sun, the most offensive effluvia—even our market and the space around it not paved, and the earth constantly covered with offal matter thrown away by the butchers; it is strikingly true, that many of the sick to whom I have been called, went out well in the morning, and came home from market affected with the symptoms. The conclusion to be drawn, then, from these observations is, that I do not think the fever infectious individually, but from a certain aptitude in the body of every individual, in this climate, at this season of the year, meeting with the exciting causes of labour and fatigue in the heat, sudden obstruction of perspiration by rain or night air; intemperance in drink or diet; are thrown into fever, which fever is modified by the predominant exhalations with which the atmosphere is loaded. From the uniformity of the symptoms of the fever, which has prevailed here at this season for several years past, and its correspondence with the epidemics in other parts of the continent, I think we may safely reason in this way; and as the faculty in different situations have

given different appellations to what I think the same disease, it will be thought sufficient, perhaps, after what I have said, to enumerate the symptoms. It attacks suddenly, with violent pain in the head and eyes, back and limbs; languor, weakness, and sickness at stomach; great tenderness, heat, and pain at the pit of the stomach, and over the region of the liver, preceded mostly by a chill:—sometimes it approaches more slowly and insidiously, but not less dangerous; for, about the fourth and fifth day, if timely and proper remedies have not been administered, a hiccup and vomiting of blackish matter, like coffee grounds, sometimes mixed with dark-coloured blood, comes on, attended with profuse hemorrhages from the nose, gums, and intestines, which generally carries them off by the sixth day. I have prescribed for upwards of three hundred in this fever since June last, and I am sure I am accurate when I say, only eight of them have died; two only of whom were visited on the first day of their illness, and in one of these cases, I was interrupted in my method of treatment, and the other lay in a small and filthy apartment, with two more in the same complaint.

However, Sir, I am only one of five or six practitioners at this end of the city, and may, notwithstanding my success, be too sanguine, though not singular in my opinion; beg leave, therefore, to refer you to them for further information. I am, with much respect for you and the commissioners of health,

Your obedient and humble servant,

JOHN COULTER.

Baltimore, East, August 26, 1797.

TO THE SAME.

Sir,

IN answer to your request, I inform you that I have several patients labouring under a fever of a highly inflammatory nature; but when early application is made, generally yields to medicine. I cannot imagine those complaints to be derived from importation; neither do I conceive them to be contagious at present: but dread the subsequent consequences without some provision for the better accommodation of the poor in this place.

Yours, with the highest respect,

JOSEPH ALLENDER.

Baltimore, East, August 27, 1797.

TO THE SAME.

Sir,

OUT of about twenty-one patients now under my care, eighteen of them appear to be confined by bilious remittent and inter-

mitting fevers; and I am happy to add, that I have lost only two within these six or eight weeks that have died. In no case, that has come to my knowledge, has the disease originated from contagion. I believe our end of the city is as healthy as common for this season of the year.

I am, Sir, with respect,
Your most obedient servant,
J. JAQUITT.

Baltimore, East, August 27, 1797.

From these communications, the board was satisfied that the fever in question was not individually contagious; and that there was at that time no cause of great alarm, they conceived themselves warranted to believe, inasmuch as out of three hundred patients under the care of Dr. Coulter, a gentleman of undoubted veracity, he lost only so small a number as eight, from the third week in June to the 26th of August.

Yet they did not cease their inquiries here, but desirous of investigating the subject fully, invited all the physicians respectively known to them in every part of the city, to meet them at the Exchange, on the 28th of August. At that meeting Dr. Coulter's and Dr. Allender's letters were read, (the other not being yet received) and the question was put to every attending physician, whether any case of contagious or yellow fever had come under their notice, which (except one case of Dr. Davidge's, of a woman who had come from Philadelphia, but was then recovered, and one other case at Fell's-Point, thought somewhat suspicious by Dr. Smith) they individually answered in the negative. This sentiment was further confirmed by Doctors Goodwin, Moores, and Davidge, who, at the request of the meeting, went to Fell's-Point and visited a number of the sick, as appears by the following report:

Baltimore, August 29, 1797.

AGREEABLY to your request, we yesterday evening visited a number of sick at Fell's-Point, and are happy in assuring you that we discovered nothing like a malignant, contagious, or yellow fever: the patients we saw, all laboured under the common bilious remittent, and will generally recover with common attention: we therefore can very confidently say, that we do not think there is at present any cause of alarm.

LYDE GOODWIN,
DANIEL MOORES,
JOHN B. DAVIDGE.

The Commissioners of Health.

The result of these investigations was, that the uneasiness and fears of the people began to abate, it being generally believed that the complaint was of the bilious remittent kind; and the few deaths, compared to the number of the sick, inspired a hope, that by proper attention and assistance, the sick would generally be restored to health. Matters continued in this state until the 2d of September, when the chairman received a letter from one of the commissioners residing at Fell's-Point, of which the following is an extract:

"SIR,

"A communication has been made to me from Dr. Allender, "advising of several persons labouring under a fever, who, from "their filthy situation and want of necessaries, must fall victims "to the disease. Dr. Coulter, who attends my family, says that "the disease has much increased within these two days past. "There can be no doubt that we have something more than com- "mon amongst us. I should be glad that a few of the commis- "sioners would come down and view our situation."

The following morning, five members of the board, accompanied by Dr. Moores from the west part of the city, went to Fell's-Point, and, desirous of obtaining full information, inquired of the respective physicians there of the number of their patients, and how many of them they thought dangerous; and being conducted to the worst of them, went into their houses with Dr. Moores, the accompanying physician.

The result of this further labour was, that the disorder had indeed spread, yet chiefly among the poor who lived in confined houses; the number of deaths, however, as well as the number of sick deemed dangerous by the respective physicians, was comparatively small; the number of Dr. Coulter's patients, that were thought dangerous by his young man, was four or five; Dr. Allender's, three; the other physicians, not exceeding two. The attending physician was still of opinion, that as yet there was no contagion in the disorder, that the sick wanted good nursing more than any thing else, and that, with proper attention and care, many would recover.

There being no suitable hospital provided by the corporation, to which the indigent sick might be removed, the board had no other alternative than to afford relief to those who needed it, in the houses in which they lay: they therefore requested the practising physicians in that district, to inform any member of the board of such cases, that their wants might be supplied; and whenever such information was received, every necessary relief was afforded.

This being the real situation in which the commissioners of health found the Point on the 3d of September, they returned agreeably disappointed, that matters were not worse; and as it was not their duty to spread useless alarms, but to afford comfort and assistance to the sick who were in need, (which they had not neglected) they could not help feeling a hope, as Christians, that God, to whom all seasons and times are alike, would providentially interpose, and arrest the farther progress of the disease.

It was, however, in the ensuing week, that the disorder put on a more threatening appearance. A large number of people having collected to see the launching of the frigate, on the 7th of September, many of them getting wet, being exposed to a hot and disagreeable sun, and undergoing considerable fatigue, excited in themselves symptoms of the complaint. Hitherto the sickness was confined to Fell's-Point, but now several persons in West Baltimore, who attended the launch, were taken suddenly ill, and died in a few days—and it is worthy of observation, that until the day after the launch, the board of health never received any regular information that there was contagion in the disease; for at the meeting of the physicians and commissioners of health, at the Exchange, the former were requested, that whenever any case of a contagious disorder came under their notice, to leave information thereof with the chairman of the board, and on the 8th of September, and not before, was such information given by Dr. Moores.

In consequence of this advice, a meeting of the board was immediately called, to consult on the measure that *now* became necessary for them to adopt; it was agreed, in the first place, to call a meeting of the physicians generally, and ask their information and advice; accordingly, a large number of the faculty met on the 11th of September, of which the result was as follows:

"At a meeting of the physicians of Baltimore, convened at "the house of Mr. Fonerden, by desire of the commissioners of "health, in order to suggest the most effectual means of obviating "the evil effects of a disease, which has of late proved very fatal "at Fell's-Point, it was unanimously agreed to recommend to the "commissioners,

"That the causes which produce the disease, may be corrected "as far as possible.

"That all possible regard may be had to cleanliness, within and "without doors, by removing every thing filthy, putrid and offen-"sive, and particularly to preserve the persons of the patients "from uncleanliness.

"That all such as are diseased, and in a state that admits of "removal, and whose circumstances incapacitate them from pro-"curing the aid necessary, should have a proper place provided for "them.

" That the air of neglected and foul apartments be corrected by " chemical means.

" That too many persons, though in a state of health, be pre- " vented from crowding into the same apartment, or even into " the same houses.

" That all unnecessary communication with infected persons " and places be prevented.

" That the air of close and infected places be refreshed with " artificial showers, by means of fire-engines.

" That the necessities of the indigent, who are at present labour- " ing under the disease, should be relieved until it may be con- " venient to remove them."

At the close of this meeting the chairman requested the further advice of the physicians respecting two particulars: 1st. whether they thought it expedient or proper, that the board should, by a publication, advise their fellow-citizens to remove into the country; or whether, 2dly, they should endeavour to stop the communication between the town and Point—both of which they declared to be improper.

Here it will be regular to notice what was the duty of the commissioners of health at this crisis—The ordinance of the corporation, under which they were appointed, (page 45.) describes their duty, and the means to discharge it, thus—" *They shall cause all* " *persons actually labouring under infectious diseases, and not otherwise* " *provided for, to be removed to the hospital at Hawkins's-Point, or else-* " *where, distant from the city at least three miles; and provide for the* " *infected, such meats, drinks, bedding and clothing, as may be abso-* " *lutely necessary, or ordered by the health-officer; and with the advice* " *of the health-officer, or other practising physician or physicians whom* " *they may consult, may take such further measures in discharging the* " *trust confided to them, as may appear reasonable and proper.*"

Their duty is seen by the things they are to do. Their means are, the hospital on Hawkins's-Point, and 2000 dollars appropriated by ordinance, (page 103.) for the health department for the present year. With respect to providing for the poor sick, the necessary comforts and medical assistance their situation required, and promoting cleanliness as far as their authority and influence extended, they did carry into effect the advice of the physicians, and faithfully discharged their duty—they feel a consciousness of having neglected none when applied to for relief—they did not shrink in the hour of danger, but visited the sick, and were among them when their presence could be of service.

The removing the sick to an hospital, or a proper place to receive them, was not so easy. The hour of difficulty and danger had now come, but no proper place had been provided by the corporation—the hospital on Hawkins's-Point, was erected chiefly for

a marine purpose, but was supposed might be made use of in such an extremity as this for the citizens; the trial, however, was to be made—It was now made, and being found impracticable was abandoned. The opposing difficulties were the great distance of the place, the length of time the passage required, and the impossibility of getting there in rough and boisterous weather.

Men struggling with such difficulties, at such a trying time, with their funds nearly exhausted, every person looking up to them to stop the progress of the disease, or confine its limits, was discouraging indeed. However, after considerable search, a house for a temporary hospital was obtained, not far from the Point; to this were conveyed such poor sick as were not otherwise provided for; but the house being small, could serve but little towards checking the disease, or confining its ravages. It afforded, however, some comfort and accommodation to many, who otherwise would have suffered extremely. On the 11th of September, the hospital was opened; Dr. Way was employed to attend it; and, after some trouble and difficulty, five nurses were provided. We regret the necessity that obliged us to refuse admittance to some for whom application was made, when there was no room; this may have given offence: but was it possible for men, thus circumstanced, to avoid the censures of inconsiderate or weak minds? The smallness of the house constrained us also to adopt a resolution not to admit people of colour; they in like manner gave umbrage: but what man of reason could conceive it proper to crowd together blacks and whites, in a house too small to contain the whites? Had the house been sufficiently large to admit all who applied, and the funds in proportion, some useful lives might perhaps have been preserved. The funds, however, were only commensurate to ordinary years, and without any extraordinary sickness, are swallowed up by the marine department: of consequence a considerable debt is incurred by us. We know well that the corporation is yet in its infancy, and that every useful institution cannot immediately be adopted.

With respect to our not having alarmed the inhabitants and advised their removal, we shall only observe, the ordinance under which we acted required, in extraordinary cases, that "with the "advice of the health-officer, or practising physician or physicians, "we might take such further measures as might appear reasonable "and proper." But when the physicians of Baltimore were met in a body, and advised us not to take such a measure, our path was plain before us.

This plain, unadorned narrative of facts will enable the corporation and our fellow-citizens to judge of our conduct; they will hence see what credit is due to newspaper scribblers, whose aim is to write themselves into notice by a display of their talents; to

deal in exaggeration, slander, and falshood, is not difficult for such authors; they can with ease make a common grave-yard of a whole district, and turn a city into a deserted wilderness. The annexed list of the number of deaths, from the 1st of August to the 11th of September, both days inclusive, certified under the hands of the respective clergymen and sextons in the city, with the amount of the daily returns from thence to the 29th of October, and the whole number of persons that removed from Fell's-Point, and of those who remained, accurately taken from house to house, by persons appointed for that purpose, will assist to shew what was the real state of the city during the sickness.

We can with truth add, that we have endeavoured to do our duty to the best of our knowledge, with the means we possessed, in alleviating the sufferings of our fellow-citizens in every possible shape. If the services we have performed meet with the approbation of the corporation, and of our fellow-citizens, we are satisfied and ask for no other reward.

JEREMIAH YELLOTT,
ADAM FONERDEN,
JAMES EDWARDS,
EMANUEL KENT,
JOSEPH TOWNSEND,
ELIAS ELLICOTT,
JOHN STEELE,
THOMAS TENANT,
JAMES BEEMAN,
} Commiss'rs of Health.

Baltimore, November 17th, 1797.

The following is an accurate return of all the interments in the several burying-grounds in this city and precincts, from the 1st day of August to the 11th of September following, including both days, as certified under the hands of the respective clergymen and sextons, viz.

	Adults.	*Children.*
	97	74
Total amount of interments, daily published by the board, from the 11th of September to the 29th of October following, viz.	311	63
	408	137

Total amount of the number of persons that removed from Fell's-Point, and of those that remained during the sickness, viz.

Removed.	*Remained.*
671	2679

This enumeration was taken from the Causeway eastward, on each side of the Causeway-street, and from thence all to the southward thereof.

CORPORATION OF THE CITY OF BALTIMORE.

RESOLVED,

That the Commissioners of Health, for this city, since their appointment, and especially during the late prevailing sickness, have discharged the laborious duties of their office with care, attention, assiduity, and good faith, and have a just claim to the approbation and thanks of this Corporation.

November 20th, 1797.

In the First Branch of the City Council, read and agreed to unanimously.

HERCULES COURTENAY, President.

November 20th, 1797.

In the Second Branch of the City Council, read and agreed to unanimously.

JOHN MERRYMAN, President.

APPROVED, *November* 23, 1797.

JAMES CALHOUN, Mayor of the City of Baltimore.

ARTICLE II.

From the American Daily Advertiser.

Messrs. Claypoole,

You will oblige many of your fellow-citizens by publishing the following Letter from the Governor, and the consequent Report of a number of Physicians of this City, to which the Governor refers, among other Documents, in that part of his Address to the Legislature which regards the Health of the City, and a copious supply of Water by means of Canals, &c.

SIR, *Philadelphia, 6th November*, 1797.

I AM desirous to obtain, for the information of the Legislature, the most correct account of the origin, progress, and nature of the disease that has recently afflicted the city of Philadelphia, with a view that the most efficacious steps should be taken to prevent a recurrence of so dreadful a calamity. I have requested the opinion of the College of Physicians on the subject; but, as I understand that you and many other learned members of the Faculty do not attend the deliberations of that institution, the result of my inquiries cannot be perfectly satisfactory without your co-opera-

tion and assistance. Permit me, therefore, Sir, to beg the favour of you, and such of your brethren as you shall be pleased to consult, to state, in answer to this letter, the opinion which your researches and experience have enabled you to form on the important object of the present investigation.

I am, respectfully, Sir,
Your most obedient,
Humble Servant,
THOMAS MIFFLIN.

Dr. BENJAMIN RUSH.

SIR,

IN compliance with your request, the subscribers have devoted themselves to the investigation of the origin, progress, and nature of the fever which lately prevailed in our city, and we have now the honour of communicating to you the result of our inquiries and observations.

We conceive the fever which has lately prevailed in our city, commonly called the Yellow Fever, to be the Bilious Remitting Fever of warm climates, excited to a higher degree of malignity by circumstances to be mentioned hereafter.

Our reasons for this opinion are as follow:

1st. The sameness of their origin, both being the offspring of putrefaction. Of this there are many proofs in the histories of the Yellow Fever in the West-Indies. Where there is no putrefaction, the West-India islands enjoy a perfect exemption from that disease in common with northern climates.

2d. The Yellow Fever makes its appearance in those months chiefly in which the Bilious Fever prevails in our country, and is uniformly checked and destroyed by the same causes, viz. heavy rains and frosts.

3d. The symptoms of the Bilious and Yellow Fever are the same in their nature. They differ only in their degree. It is no objection to this assertion, that there is sometimes a deficiency or absence of bile in the Yellow Fever. This symptom is the effect only of a torpid state of the liver, produced by the greater force of the disease acting upon that part of the body. By means of depleting remedies this torpor is removed, and the disease thereby made to assume its original and simple bilious character.

4th. The common Bilious and Yellow Fever often run into each other. By depleting remedies the most malignant Yellow Fever may be changed into a common Bilious Fever; and by tonic remedies, improperly applied, the common Bilious Fever may be made to assume the symptoms of the most malignant Yellow Fever.

5th. The common Bilious and Yellow Fevers are alike conta-

gious, under certain circumstances of the weather, and of predisposition in the body. That the common Bilious Fever is contagious, we assert from the observations of some of us, and from the authority of many physicians who have long commanded the highest respect in medicine.

6th. The yellow and mild bilious fevers mutually propagate each other. We conceive a belief in the unity of these two states of fever, to be deeply interesting to humanity, inasmuch as it may lead patients to an early application for medical aid, and physicians to the use of the same remedies for each of them, varying those remedies only according to the force of the disorder. It is no objection to this opinion, that that state of Bilious Fever called the Yellow Fever, is a *modern* appearance in our country. From certain revolutions in the atmosphere, as yet observed only, but not accounted for by physicians, diseases have in all ages and countries, alternately risen and fallen in their force and danger. At present, a constitution of the atmosphere prevails in the United States, which disposes to fever of a highly inflammatory character. It began in the year 1793. Its duration in other countries has been from one to fifty years. It is not peculiar to the common Bilious Fever, to have put on more inflammatory symptoms than in former years. There is scarcely a disease which has not been affected in a similar way by the late change in our atmosphere, and that does not call for a greater force of depleting remedies than were required to cure them before the year 1793.

7th. and lastly. The Yellow Fever affects the system more than once, in common with the Bilious Fever. Of this there were many instances during the prevalence of our late epidemic.

The fever which lately prevailed in our city appears, from the documents which accompany this letter, to have been derived from the following sources.

1st. Putrid exhalations from the gutters, streets, ponds, and marshy grounds in the neighbourhood of the city. From some one of these sources, we derive a case attended by Dr. Caldwell, on the 9th of June—one attended by Dr. Pascalis, on the 22d of July, and by two cases attended by Dr. Rush and Dr. Physick, on the 5th and 15th of the same month; and also most of those cases of Yellow Fever, which appeared in the northern parts of the city, and near Kensington bridge, in the months of August, September, and October. We are the more satisfied of the truth of this source of the fever, from the numerous accounts we have received of the prevalence of the same fever, and from the same causes, during the late autumn in New-York, and in various parts of New-Jersey, Pennsylvania, Maryland, Virginia, and South-Carolina, not only in sea-ports, but inland towns. The peculiar disposition of these exhalations, to produce disease and death, was evinced early in the

season, by the mortality which prevailed among the cats, and during every part of the season, by the mortality which prevailed in many parts of our country among horses. The disease which proved so fatal to the latter animals, is known among the farmers by the name of the yellow water. We conceive it to be a modification of the Yellow Fever.

2dly. A second source of our late fever, appears to have been derived from the noxious air emitted from the hold of the Snow Navigation, Capt. Linstroom, which arrived, with a healthy crew, from Marseilles, on the 25th of July, and discharged her cargo at Latimer's wharf, after a passage of eighty days. We are led to ascribe the principal part of the disease which prevailed in the south end of the city, to this noxious air, and that for the following reasons.

1st. The fever appeared first on board this vessel, and in its neighbourhood, affecting a great number of persons nearly at the same time, and so remote from each other, that it could not be propagated by contagion.

2dly. There was in the hold of this vessel, a quantity of vegetable matters, such as prunes, almonds, olives, capers, and several other articles, some of which were in a state of putrefaction.

3dly. A most offensive smell was emitted from this vessel after she had discharged her cargo, which was perceived by persons several hundred feet from the wharf where she was moored.

4thly. A similar fever has been produced from similar causes, in a variety of instances: we shall briefly mention a few of them.

At Tortola, a fever was produced in the month of June, in the year 1787, on board the ship Britannia, Capt. James Welch, from the noxious air generated from a few bushels of potatoes, which destroyed the captain, mate, and most of the crew, in a few days.

Two sailors were affected with a malignant fever, on board the ———, Capt. Thomas Egger, in the month of March, 1797, from the noxious air produced by wine that had putrified in the hold of the ship, one of whom soon died after her arrival in Philadelphia.

In the month of June, 1793, the Yellow Fever was generated by the noxious air of some rotted bags of pepper, on board a French Indiaman, which was carried into the port of Bridgetown, by the British letter-of-marque Pilgrim. All the white men and most of the negroes employed in removing this pepper, perished with the Yellow Fever, and the foul atmosphere affected the town, where it proved fatal to many of the inhabitants.

On board the Busbridge Indiaman, a Yellow Fever was produced in the month of May, 1792, on her passage from England to Madras, which affected above two hundred of the crew. It was

supposed to be derived from infection, but many circumstances concur to make it probable that it was derived from noxious air. The absence of smell in the air does not militate against this opinion, for there are many proofs of the most malignant fevers being brought on by airs which produced no impression on the sense of smelling. This is more frequently the case, when the impure air has passed a considerable distance from its source, and becomes diluted with the purer air of the atmosphere.

Several cases are related by Dr. Lind, in his treatise upon fever and infection, of the Yellow Fever originating at sea, under circumstances which forbade the suspicion of infection, and which can only be ascribed to the impure air generated from putrid vegetables.

So well known, and so generally admitted is this source of Yellow Fever in warm climates, that Dr. Shannon, a late writer upon the means of preventing the diseases of warm climates, in enumerating its various causes, expressly mentions "the putrid effluvia of a ship's hold."

We wish due attention to be paid to these facts, not only because they lead to the certain means of preventing one of the sources of this fever, but because they explain the reasons why sailors are so often its first victims, and why, from this circumstance, the origin of the disease has been so hastily, but erroneously ascribed solely to importation.

The fever which prevailed along the shore of the Delaware, in Kensington, and which proved fatal to Mr. Joseph Bowers and two of his family, we believe, originated from the noxious air emitted from the hold of the ship Huldah, Capt. William Warner. This air was generated by the putrefaction of coffee, which had remained there during her voyage from Philadelphia to Hamburgh and back again.

In the course of our inquiries, we were led to suspect one source of our late fever to be of foreign origin. The sails of the armed ship Hinde, on board of which several persons had died of the Yellow Fever, on her passage from Port-au-Prince, and which arrived on the 4th of August, were sent to the sail-store of Mr. Moyse. Four persons belonging to the loft were soon afterwards affected with symptoms of a bilious Yellow Fever. We shall not decide positively upon the origin of the fever in these cases; but the following facts render it probable that it was not derived from the persons who had died of it on board the suspected vessel. 1st, the sails emitted an offensive smell; 2d, three of the cases of the persons affected in the sail-loft, were of a mild grade of the fever; 3d, the fever was not propagated by contagion from any one of them; 4th, the sail-loft was within the influence of the noxious air which was emitted from the hold of the Snow Naviga-

tion, being not more than fifty yards, and was in the direction of the wind which blew at that time over her. The extent of this air has not been accurately ascertained, but many analogies give us reason to believe that it may be conveyed by the wind, in its deleterious state, from half a mile, to a mile.

In support of the opinion we have delivered of the origin of our late fever, we must add further, that in that part of the city which lies between Walnut and Vine streets, and which appeared to be free from the effects of exhalation and the noxious air of the ships, there were but few cases of the fever which appeared to spread by contagion, even under the most favourable circumstances for that purpose.

Having pointed out the nature and origin of our late fever, we hope we shall be excused in mentioning the means of preventing it in future. These are,

First, A continuance of the present laws for preventing the importation of the disease from the West-Indies, and other parts of the world where it usually prevails.

Secondly, Removing all those matters from our streets, gutters, cellars, gardens, yards, stores, vaults, ponds, &c. which, by putrefaction in warm weather, afford the most frequent remote cause of the disease, in all countries. For this purpose we recommend the appointment of a certain number of physicians, whose business it shall be to inspect all such places in the city, the Northern Liberties, and Southwark, as contain any matters capable, by putrefaction, of producing the disease, and to have them removed.

Thirdly, We earnestly recommend the frequent washing of all impure parts of the city in warm and dry weather, by means of the pumps, until the water of the Schuylkill can be made to wash all the streets of the city; a measure which we conceive promises to our citizens the most durable exemption from bilious fevers of all kinds, of domestic origin.

Fourthly, To guard against the frequent source of Yellow Fever from the noxious air of the holds of ships, we recommend the unlading all ships, with cargoes liable to putrefaction, at a distance from the city, during the months of June, July, August, September and October. To prevent the generation of noxious air in the ships, we conceive every vessel should be obliged, by law, to carry and use a ventilator; and we recommend, in a particular manner, the one lately contrived by Mr. Benjamin Wynkoop.—We believe this invention to be one of the most important and useful that has been made in modern times, and that it is calculated to prevent not only the decay of ships and cargoes, but a very frequent source of pestilential diseases of all kinds in commercial cities.

In thus deciding upon the nature and origin of our late fever,

we expect to administer consolation to our fellow-citizens upon the cause of our late calamity, for, in pointing out its origin to the senses, we are enabled immediately and certainly to prevent it. But while the only source of it is believed to be from abroad, and while its entrance into our city is believed to be in ways so numerous and insidious, as to elude the utmost possible vigilance of health-officers, we are led in despair to consider the disease as removed beyond the prevention of human power or wisdom. It has been by adopting measures similar to those we have delivered for preventing pestilential diseases, that most of the cities in Europe, which are situated in warm latitudes, have become healthy in warm seasons, and amidst the closest commercial intercourse with nations and islands constantly afflicted with those diseases. The extraordinary cleanliness of the Hollanders, was originally imposed upon them by the frequency of pestilential fevers in their cities. This habit of cleanliness has continued to characterize those people after the causes which produced it have probably ceased to be known.

In thus urging a regard to the domestic sources of the Yellow Fever, we are actuated by motives of magnitude far beyond those which determine ordinary questions in science. Though we feel the strongest conviction that the value of property, the increase of commerce, and the general prosperity of our city, will be eminently forwarded by the adoption of the foregoing propositions, yet these are but little objects in our view, when compared with the prevention of the immense mass of distress which never fails to accompany a mortal epidemic. We consider ourselves, moreover, as deciding upon a question which is to affect the lives and happiness, not only of the present inhabitants of Philadelphia, but of millions yet unborn in every part of the globe.

We are, with the greatest respect,
Sir,
Your very humble servants,
BENJAMIN RUSH,
CHARLES CALDWELL,
WILLIAM DEWEES,
JOHN REDMAN COXE,
PHILIP SYNG PHYSICK,
JAMES REYNOLDS,
FRANCIS BOWES SAYRE,
JOHN C. OTTO,
WILLIAM BOYS,
SAMUEL COOPER,
JAMES STUART,
FELIX PASCALIS,
JOSEPH STRONG.

ARTICLE III.

From the American Daily Advertiser.

Messrs. Claypoole,

Be pleased to give the following Letter, from the Governor, to the College of Physicians, with their Answer, a place in your paper, and oblige

I.

January 8, 1798.

SIR,

AS I am desirous to lay before the Legislature a statement of the circumstances attending the calamity which has recently visited the city of Philadelphia, permit me, through you, to request the aid of the College of Physicians in satisfying the following inquiry:

What measures ought to be pursued to purify the city from any latent infection? and what precautions are best calculated to guard against the future occurrence of a similar calamity?

I am persuaded the public spirit and benevolence of the College of Physicians, will induce them cheerfully to excuse, and to comply with this request, which is intended to establish a foundation for regulations, that may co-operate with their professional labours in preserving to their fellow-citizens, the invaluable blessings of health.

I am, with great esteem, Sir,
Your most obedient humble servant,
THOMAS MIFFLIN.

Germantown, October 24, 1797.

To Dr. JOHN REDMAN, *President of the College of Physicians.*

SIR,

WE have duly considered your letter of the 24th ult. and shall cheerfully comply with the requisitions contained therein.

The measures to be pursued for purifying the city from any latent infection, are such as we have heretofore recommended, viz. A strict attention to cleanliness, washing, white-washing, and ventilating the infected houses, bedding, and cloathing, and fumigating them with charcoal and sulphur, or a mixture of oil of vitriol and salt-petre. These, with the frost, we believe, will be found sufficient intirely to destroy any latent contagion.

But the latter part of your inquiry, viz. what precautions are best calculated to guard against the future occurrence of a similar

calamity, is an object of such magnitude, as to demand a more particular reply.

We have, on former occasions, communicated our sentiments on this head; but as you now inform us, that it is intended to establish a foundation for future regulations, we willingly enter into the detail, and though this will principally consist of repetition, yet it may be useful to have our ideas presented in one view for your consideration. And as these sentiments have been more fully confirmed by recent events, we are again induced earnestly to recommend a strict adoption of the measures we advised in our communication of August 18th, 1797, as being the best calculated to guard against the future introduction of contagious diseases. We now recapitulate those advices, with some additions.

Let an entire new health-law be made, constituting a Board of Health, to consist of five persons, two of whom to be practitioners of physic. The smallness of the number will ensure responsibility and a constant residence in the city; and the professional knowledge will be necessary to assist in directing the measures of the Board. Let no person whose private interest may be affected by quarantine laws be a member of this Board.

Let a sufficient sum of money per annum be subject to the drafts of the Board, who shall render to the Assembly, a yearly account of their expenditures. Let this Board sit daily during the months of July, August, September, and October; and during these months, let every vessel from the Mediterranean, coast of Africa, West-Indies, and continent of America, to the southward of Florida, perform an effectual quarantine. Let the cargoes of suspicious vessels be unloaded, and, with the vessels, be purified at the island.

Let a resident physician or health-officer be appointed, who shall never be absent from the island, during the above-mentioned months; and a consulting physician, who shall reside at Philadelphia.

Let the punishment of a master of a vessel, who evades the law, by landing cargo, crew, or passengers, contrary to the intent and meaning of it, be the same as for murder of the second degree. Let no vessel of war be allowed to come above the fort.

Let the Board of Health have full power, with the concurrence of the Governor, to cut off the intercourse with infected persons and places. Let the long projected hospital be erected.

Let the most diligent and scrupulous attention be given for cleaning and watering the streets, gutters, and wharves, throughout the city and liberties.

Such are the precautions which we believe best calculated to guard against the future occurrence of calamities similar to those we have experienced. If further discoveries shall happily add to

our knowledge on this important subject; we shall not fail to make such communications to the Governor without delay.

By order of the College of Physicians,
JOHN REDMAN, President.

THOMAS C. JAMES, Secretary.

Philadelphia, November 7, 1797.

To his excellency Thomas Mifflin, Esq. Governor of the Commonwealth of Pennsylvania.

ARTICLE IV.

To the SENATE *and* HOUSE *of* REPRESENTATIVES *of the Commonwealth of Pennsylvania, the Memorial of the* COLLEGE *of* PHYSICIANS *of Philadelphia represents:*

THAT your memoralists, deeply affected with the calamities produced by the disease which has recently occurred amongst us, are impelled, by a sense of duty to their fellow-citizens and themselves, to inform you, that they consider the laws which were enacted for the purpose of preserving this city from malignant contagious disorders, are very imperfect.

The subject being of immense importance, they hope to be excused for stating their sentiments with respect to it at large.

They are of opinion that the disease which produced so much mortality and distress in the year 1793, was imported into this city from the West-Indies; and they are confirmed in this sentiment, by the circumstances attending the disease of this year, which they consider of the same nature and derived from the same source.

Some of their most important reasons for this opinion are as follow:—The disease in question is essentially different from the fevers that occur in this climate, and which originate from domestic causes. This difference particularly regards the general progress of the symptoms, and the mortality, as is evident upon a comparison of its history with that of the ordinary diseases of this city.

A disease which resembles the fever of 1793, and of this year, in many important points, has long been known in the West-Indies, and in those parts of America situated between the tropics; and in seven or eight different instances, in which a similar disease has occurred in the United States, in the course of this century, there is good reason to believe that it was derived from those countries. In most of the instances, the original history of the disease contains the information that it was imported. In some cases, the

infection can be traced to the imported clothing of persons who died in the West-Indies. In most of the cases where the importation cannot be ascertained, the first appearance of the disease has been, as in the other instances, in the neighbourhood of the shipping, or among persons connected with vessels.

The circumstances attending the fever of this year are extremely in point; and the narrative which accompanies this, will, we trust, satisfy you that it was imported. The disease in question commenced invariably in our sea-ports, while inland towns, equally exposed to the ordinary causes of fever, escaped; and in the two last instances of its occurrence in Philadelphia, the suburbs and the country adjacent, were more healthy than usual at the same season; and at the commencement of the disease, all the parts of the city, excepting the small spaces to which it was confined, were remarkably healthy.

It exists in the West-Indies, particularly in time of war, when great numbers of strangers are to be found there; and reference to dates will shew, that in most of the instances of the occurrence of the disease in the United States, there has been war in the West-Indies.

Your memoralists are aware, that cases may be adduced where the disease has occurred in persons who were not known to have been exposed to imported contagion; but such is the subtile nature of this power, that it often exists unsuspected; and similar difficulties occur respecting the small-pox, and other contagions, allowed by all to be of foreign origin. There also occur, although very rarely, solitary cases of malignant remitting fevers, the symptoms of which resemble so much the disease in question, that they are often supposed to be the same; but there is this essential difference, that a malignant remittent fever has never been, to our knowledge, contagious in this climate.

The difference of sentiment among physicians, now so much regretted, resembles that which almost always takes place, when the plague is introduced into any of the civilized parts of Europe, where it is not well known. The identity of the disease, its origin and its contagious nature, have been often the subject of controversy. Some physicians have considered it as of domestic origin; but proper health-laws, strictly enforced, have latterly protected the commercial parts of Europe from its ravages.

With these sentiments of the nature of the disease, your memoralists cannot but regard a proper law respecting the subject, as a matter of the greatest importance; and although they are perfectly sensible of the imperfection of the science of medicine, yet, from a conviction that physicians are the best informed, as well as the most interested in the subject, they approach you with that respect which is due to your legislative authority, and declare their belief,

that the existing health-laws of this commonwealth are not such as are best calculated to obtain the desired end, and that they ought to be improved.

Having lately communicated in writing to the Governor, their ideas respecting the best methods of preventing the introduction of contagious diseases, they beg leave to refer you to that communication. At the same time they tender you their professional assistance in framing an efficient law for this purpose; and thus having performed their duty, they hold themselves discharged from all responsibility, on account of the evils which may arise from the present imperfect state of the legislative arrangements respecting this important subject.

By order of the College,
JOHN REDMAN, President.

Attest. THOMAS C. JAMES, Secretary.

Philadelphia, December 5, 1797.

ARTICLE V.

From the Commercial Advertiser.

To NOAH WEBSTER, *Junior, Esquire.*

DEAR SIR, *New-York, Dec.* 10, 1797.

THE inclosed account of the operation of the manure collected from the streets of our city, in increasing the productiveness of land, was lately put into my hands for the information of the Agricultural Society; and I have been directed to cause it to be made public. The extraordinary crops of Indian corn afforded by it, redound highly to the skill and judgment of the gentlemen who undertook the experiments. The subject is interesting in several respects. To our farmers it must be peculiarly agreeable to learn what a great amount of grain can be raised by proper management on a small piece of land. To our Commissioners of the Health-Office, it must be no less welcome intelligence, that the collected mass of nuisance which they are, with such happy success, engaged in removing from the city, is convertible by the powers of vegetation, from poison to wholesome articles of food. To the citizens at large, and particularly to yourself, who have explored with such minuteness and such extent of research, the connection between these local and domestic sources of pestilential exhalations, and our annual visitations of endemic distempers—there must be high satisfaction in contemplating how the purity and

healthiness of the towns may contribute to the thriftiness and wealth of the surrounding country—And to all of us, it is matter of the utmost moment, to receive additional proofs of the power of the alkaline qualities of the lime, pot-ash and soda, thrown out and scattered about the streets, to neutralize the acid vapours which excite fevers and plagues among us, and convert them into the richest of manures; and thus, by one operation, clearing the atmosphere of its noxious fumes, and preparing nourishment for the vegetable world.

I hope one day to be able to add to these testimonials, the result of my own experiments on these carbonates and septites of lime, pot-ash and soda, in raising crops of barley and wheat; and in the mean time entertain the hope, that further particulars concerning the operation of the *street manure*, in raising Indian corn, will be given us by the gentlemen who have conducted the experiments I send you. I think we are getting on the right track of inquiry about these matters, and shall soon be able, for it is most certainly in our power, to make pestilence submit to municipal and agricultural regulations. Yours with much esteem,

SAMUEL L. MITCHILL, Secretary.

To the Secretary of the Agricultural Society of New-York.

A FEW days ago I saw republished in the newspapers of this city, an extract from a Jersey paper, giving an account of the great fecundity of the soil in the neighbourhood of Elizabeth-Town—155 bushels of Indian corn in the ears had been produced from an acre of land. This was certainly a great crop—but this falls vastly short of what *may* be gotten off an equal quantity of ground. As an incitement to the spirit of emulation and industry among farmers in the United States, I shall now lay before them a short account of the result of two crops of three acres each, which were planted in the neighbourhood of this city, in consequence of a wager of fifty guineas. In pursuance of the terms of this bet, which were reduced to writing, the ground in which the crop stood, belonging to each party, was accurately measured—and when gathered, each crop was measured by a person sent by the adverse party for the express purpose. From the nature of the case it is evident, that the results of these crops of corn would not fail of being ascertained with the utmost attention to accuracy. One common measure was made by both parties, and upon shelling out the ears contained in this measure, the produce of each crop was as follows:

The produce of the crop raised by Mr. John Stevens, of Hoboeken. Sum total of measures full of corn in the ear, $233\frac{2}{3}$—A measure full contained one bushel and a half and one pint of

shelled corn; 233⅔ give, consequently, 354 bushels and 6 quarts, or 118 bushels and 2 quarts per acre.

The produce of the crop raised by Mr. Daniel Ludlow, of Westchester, is as follows:

Total, 182 measures of corn in the ear. Shelled corn in a full measure, 1 bushel and a half and 4 quarts—which in 182 gives 295 bushels and 12 quarts, or 98 bushels and 14 quarts per acre.

These are truly noble crops, and do honour to the industry and agricultural skill of the cultivators; and as each of the gentlemen have in their mode of culture deviated from the common routine of practical farmers, a short account of the process adopted by each, cannot fail of proving useful and instructive to the members of the Society, and to every American farmer.

I have not had an opportunity of obtaining any minutes from Mr. L. himself respecting his crop; but am informed that he planted his corn in continued rows, at about four feet asunder, and about eight inches from stalk to stalk in the rows; and that he manured his ground with 200 horse-cart-loads of *street dirt*.

Mr. S. informs me, that he gave his ground three plowings before planting, and before the last plowing put on 700 horse-cart-loads of *street manure*—That he planted in double rows at 5½ feet asunder—that he was at the pains of dibbling in each grain. To do which with expedition and accuracy, he bored two rows of holes in a piece of board of about four feet long, so as to form equilateral triangles, the sides of which were seven inches, as thus

. . . . .

. . . . . Into these holes he drove pegs about 3½ inches long. As the corn was dropped into these holes, made with this machine, a man followed with a basket of rotten dung, with which he filled them up. Then came on the carts, out of which the rows were sprinkled with a coat of *street manure*. During the season the crop was suckered three times. The intervals were repeatedly plowed, and the rows kept perfectly clean of weeds, by hoeing and hand-weeding.

But extraordinary as this crop must appear, Mr. Stevens is confident that he should have had considerably more corn, had not his crop suffered very greatly by a thunder-storm, which laid the greater part of it down at the time the ears were setting.

AGRICOLA.

ARTICLE VI.

A Case of Hydrocele, cured by Injection. Communicated to G. PEARSON, *M. D. by Dr.* DAVID HOSACK, *of New-York.*

[*From the Annals of Medicine for* 1796.]

A MAN about forty-five years of age, of a full habit of body, captain of a vessel trading to the East-Indies, sent for me on the 20th of May, 1795, to examine a tumor on the left side of his scrotum. Upon inquiry, he told me he had first discovered it when in the East-Indies, about six years since; from which time it had gradually increased in size, but without any injury to his general health.

Upon a careful examination of the tumor, by the usual tests of hydrocele, it proved to be that disease; the testicle itself, which was easily felt at the back part of the scrotum, appeared also to be much enlarged. Satisfied as to the nature of his disease, he became anxious to have it removed as speedily as possible.

He being an intelligent man, I described to him the different methods which had been employed for the cure of it: He did not hesitate to give the preference to the one which would probably be the least painful; that is, the method of injection, as practised at present by Mr. Earle, surgeon at St. Bartholomew's Hospital, in whose hands I have several times witnessed its success.

Having ordered his bowels to be emptied, as preparatory to the operation, on the morning of the 21st, in presence of Drs. Post, Hamersley, and Tillary, three eminent physicians in this city, I drew away, by means of a trocar, upwards of a pint of water, having the appearance and smell of urine; the testicle proved to be considerably enlarged. I immediately, by the apparatus employed by Mr. Earle, injected a mixture of wine and water, in the usual proportion of two parts of the former to one of the latter, until the scrotum became distended to the size it had acquired before the operation.

The injection at first gave him little or no uneasiness; but upon being retained five minutes, he began to complain of pain: I immediately withdrew the liquor; suspended his scrotum by the assistance of the T bandage; put him to bed, and gave him fifty drops of laudanum.

His pain soon abated, but returned in the evening, with considerable tumor. I repeated his anodyne at bed-time, which gave him a comfortable night's rest. On the 22d, his tumor had increased, but was attended with very little pain: From this time it continued to increase till the 26th, when it became nearly as large

as before the operation, attended with redness and other symptoms of inflammation. On the 26th, I ordered him two ounces of Glauber's salts, in divided doses, and a poultice of bread and water to be applied to his scrotum. On the 27th, the tumor and inflammation began to subside; and, in the course of six days more, entirely disappeared, except that the testicle still remained much larger than its natural size; but in a few days, it also began to diminish.

In three weeks from the operation, he was completely freed from every symptom of hydrocele; the testicle had nearly recovered its natural size: he went about his business, to prepare his vessel for sea: and since that time he has enjoyed good health, without the least symptom of a return of his complaint. I have also since witnessed the same operation successfully performed by Dr. Post.

ARTICLE VII.

Experiments on the Cultivation of the Poppy-plant, and the Method of procuring Opium, &c. By Dr. SHADRACH RICKETSON, *of Dutchess Country, New-York.*

[*From the American Magazine, published in New-York in* 1788.]

OPIUM is the produce of the *papaver somniferum* of Linnæus, which, as a genus, comprehends two species, viz. 1. The double; 2. the single; each of which includes several varieties as to the colour of the flowers, some being white, some red, others purple and variegated.

From history we are told, that in the several provinces of Asia, it is the large white poppy only that is cultivated for the purpose of collecting opium; but, from the trials that I have made, I am of the opinion that it is a matter of indifference which species or variety of the plant is cultivated for medicinal use, as they all afford, when tapped, a juice that is similar as to quantity, colour, and every other respect, both fresh and when dried: however, I have thought that the large double species produces the greatest number of heads, and consequently the greatest quantity of juice from one seed; but of this I have not yet had sufficient trials to be certain.

Among the poppies cultivated with a view to make the present experiments, I had some that had thirty heads apiece, all of which sprung from one seed, and from one original stalk.

The poppy seeds in this country should be sown or planted about the middle of May, in rich moist ground.

The ground should be formed into areas of about four feet in width. The seeds should be planted at about ten or twelve inches distance in transverse rows, which should also be about the same distance from each other.

Shallow holes of an inch depth should be made in the rows at the distance mentioned; the seeds put in, and covered over even with the ground; after which they are suffered to remain till the plants are grown about four inches high, when, especially if the land is dry and not fertile, they may be frequently watered and manured, the best for which last purpose is said to be a compost of dung, ashes, and a nitrous earth.

They are said in the East-Indies to water them again profusely just before the flowers appear; but as I have had them grow very luxuriant and succulent in good ground, without either manuring or watering, I am disposed to think that the advantages arising from this last particular, are not adequate to the trouble of doing it.

It is scarcely necessary to remark, that the plants, from their first coming up, should be kept clean from weeds and the like, which may be done with very little trouble with a small hoe, especially if the seeds are planted after the manner I directed, that is, in rows.

Having said all that is necessary on the cultivation of the plant, I shall now proceed to describe the method of obtaining its juice, which, when inspissated to a pilular consistence, is called opium.

The states of the plants wherein I have found them to yield the most juice, are just before, in the time of, and immediately after flowering: the plants being arrived to one or other of the states above-mentioned.

We then proceed to that part of the process called tapping, which we are told is done in Asia, by making two or three longitudinal incisions in the half grown capsules, without penetrating their cavities, at sunset, and the plants suffered to remain till morning, when the juice is to be scraped off and worked in a proper vessel, in a moderate heat, till it becomes of a pilular consistence: which method, with several others, I have tried, but none have ever succeeded so well with me, as, in a sun-shining day, to cut off the stalks, at about an inch distance from their flowers or capsules, and as soon as the juice appears, which it does at first equally well on the part of the stalk cut off with the capsule or flower as on the standing part, to collect it with a small scoop or penknife, the last of which I have found to answer the purpose very well. After the juice ceases to appear on the top of the standing stalk, it should be cut off about an inch lower, when it will be found to yield almost as freely as before, and repeated as long as any juice appears.

The juice, when collected, should be put into an evaporating pan, placed in the sun's heat, and frequently stirred, till it becomes of a consistence to be formed into pills, or made into rolls for keeping or transportation.

The quantity of opium that may be procured, depends very much upon the largeness of our plants, and the care used in collecting it. From one poppy plant, I have produced seven grains of the inspissated juice.

If any would choose to have the opium freed from its impurities, it may easily be done by pressing the juice before it is evaporated through a linen strainer; but if pains be taken according to the foregoing directions, I believe there will be little or no occasion for it.

Here the following question presents itself, viz.

Does the opium I have been describing possess the same properties as the Asiatic opium?

To determine which I made the following experiments:

Experiment 1. *July* 27, 1787. At six o'clock A. M. I took one grain of this opium; at seven, breakfasted on chocolate; at a quarter after seven, I was called upon to visit a patient; I immediately mounted my horse and rode two miles, and as I rode, I felt unusually cheerful: a tinged fullness and redness of my head and face, as if I had been drinking ardent spirits, seemed also to attend me.

Nine o'clock, while at my patient's house, I felt a slight sickness at my stomach, accompanied with a moist sweat. Ten o'clock, the sickness and sweat continuing to increase, I set off for home, and on the way it just occurred to me, that the opium I had been taking was the cause of my illness, and before I reached home I puked up my breakfast, which gave me a little ease.

After I got home I was seized with vertigo, slight tremors, stupor, attended with a small contracted pulse, when I went to bed; ate no dinner; at about two o'clock P. M. I vomited a considerable quantity of sour watery fluid, after which I felt some easier, and in about an hour afterwards, I had several violent retchings, and raised some bile. Being now fatigued by the vomiting, &c. I took a large dose of the antiemetic mixture, which, after a short sleep, seemed to give me remarkable relief, and after which all the symptoms gradually vanished. I perceived my urine to be high coloured: I had no stool from the day before I took it till the morning of the 29th; and between eleven and twelve o'clock of the same day, I had three or four liquid stools, accompanied with considerable gripings.

I think it proper to remark, that during the above symptoms, I had no uncommon sleepiness.

Experiment 2. Unsatisfied with the preceding experiment, and not knowing whether the symptoms that I laboured under were solely the effect of the opium, *August* 6, at six o'clock A. M. I took a half a grain of the same kind of opium; the effects that I perceived from it were, in the forenoon, a cheerfulness, and in the afternoon a loathing, and a small degree of sickness at spells.

Experiment 3. *August* 20. At seven o'clock in the morning, I took one grain of the above-mentioned opium: Eight o'clock, breakfasted on tea; after breakfast I felt an unconcernedness, my face felt turgid, and I had some slight sickness and inclination to vomit, and about ten o'clock I had several retchings and puked, and half after ten I puked again: In short, I underwent very much the same series of symptoms as in Experiment 1st. indeed, sufficiently so to confirm me that the complaints I laboured under were solely the effects of the opium.

Experiment 4. Half after seven o'clock in the morning, I took a full grain of the Asiatic opium; at half after eight breakfasted on milk. I felt no unusual effects from it till about twelve o'clock, when a flushing and a turgid fulness of my face came on: dined at one o'clock, after which I was attacked with considerable pain in my bowels, loathing and sickness, (but not so much as to puke) which continued to remain till I went to bed. I had no stool that day as usual; no uncommon sleepiness.

Quæritur. Is the vomiting that occurred after taking the opium to be imputed and ascribed to the peculiar effect of it on the stomach, or is it to be considered as an effort of the *vis medicatrix naturæ?*

From what has been said, I think we may induce the following inferences, &c.

1. That the poppy plant is the same here as in Asia, and that the difference depends only on the climate, soil, and mode of cultivation.

2. That every species and variety of the plant, is equally capable of producing opium.

3. That the collecting of it might not only become an useful, but also a lucrative business.

4. And lastly, that the opium collected here, is as strong or stronger than the Asiatic opium: in confirmation of which, I shall beg leave to add the following passage of a letter I am favoured with, from my quondam friend and former master, Dr. Benjamin Anthony, to whom I gave some of the opium of my own procuring for trial, and who had been accustomed to use opium on account of the rheumatism: "Being in pain this morning, I took "a grain of the opium; the operation appears to be the same as

" that (of the other opium) which I have commonly used; a grain " is perhaps equal to two of the common."

Whether the virtues of opium reside in a fixed or volatile principle, is a matter that admits of a dispute: some late experiments seem to favour the latter opinion, which being admitted, one reason I think why the opium collected here is stronger than the Asiatic is, that the latter loses greatly of its strength by the long keeping and transportation which it undergoes.

FOREIGN.

ARTICLE I.

ON THE CULTURE OF OPIUM.

[*From the Annals of Medicine for* 1796.]

AMONG the premiums given by the Society in London for the encouragement of arts, manufactures, and commerce, for the year 1796, is one of fifty guineas to Mr. John Ball, of Willton, for the discovery of his method of preparing English opium, or opium prepared from poppies reared in England. This opium is attested, by several physicians who have made trial of it, and whose letters are inserted, to be at least equal in efficacy, in the same dose, to foreign opium. Mr. Ball, in one of his letters in the correspondence with the Society on this subject, asserts, that he has no doubt that the opium which he prepares from poppies growing in his own garden, may be afforded at half the price of the foreign opium: for that, in a few years, we shall be able to render it from five to eight shillings per pound, without the least adulteration. And I am of opinion, says he, that the more barren ground, which in some places lets at from two to ten shillings an acre, will, with very little expence, answer for the growth of poppies. I shall take care, this summer, to find out whether any particular sort or colour produces the most opium.

We shall give the letter entire, which contains the method of preparing the English opium.

MY LORDS AND GENTLEMEN,

BY your secretary, Mr. More, I received your resolutions respecting your purchasing from me the mode of my preparing the sample of opium, which I took the liberty of sending to you, and at the same time to beg the favour of your having a sufficient trial of its properties, which I find you have been so obliging as to have done, and likewise to have granted me the fifty guineas,

as purchase of my method of preparing opium, for which you have my sincere thanks. I am exceedingly pleased to find, that it was thought worthy of the notice of so honourable and respectable a society; and I am satisfied there can be no other mode of preparing or collecting the pure and genuine opium, than what follows.

Nothing can be more simple, or attended with less expence, than the making or extracting the pure and genuine opium from the large poppies, commonly called or known by the name of Garden-poppies, the seeds of which I would advise to be sown the latter end of February, and again about the second week of March, in beds three feet and a half wide, well prepared with good rotten dung, and often turned and ploughed, in order to mix it well, and have it fine, either in small drills, three in each bed, in the manner sallads are sown, and when about two inches high, to thin them one foot apart; or otherwise to rear them in beds in the broad-cast way, and thin them to the same distance; and if the weather should prove wet at that time, those that are taken up may be transplanted; but I do not suppose that the transplanted ones will answer, as they have but one root, and require frequent waterings. Keep them free from weeds, they will grow well, and produce from four to ten heads, shewing large and different coloured flowers, which, when the leaves die away and drop off, the pods then being in a green state, is the proper time for extracting the opium, by making four small longitudinal incisions with a sharp-pointed knife, about one inch long, on one side only of the seed-pod, just through the scarf-skin, taking care not to cut to the seeds. Immediately on the incision being made, a milky fluid will issue out, which is the opium, and, being of a glutinous nature or substance, it will adhere to the bottom of the incision; but some are so luxuriant, that it will drop from the pod on the leaves underneath. The next day, if the weather should be fine, and a good deal of sunshine, the opium will be found a greyish substance, and some almost turning black. It is then to be scraped off the pods, and, if any, from the leaves, with the edge of a knife, or an instrument for the purpose, into pans or pots; and in a day or two it will be of a proper consistence to make into a mass, and to be potted.

As soon as you have taken away all the opium from one side of the pod, then make incisions on the opposite side, and proceed in the same manner. The reason of my not making the incisions all around at the first, is, that you cannot so conveniently take away the opium; but every person, upon trial, will be the best judge.

Children may with ease be soon taught to make the incisions, and to take off the opium; so that the expence will be found exceedingly trifling. The small white seeds, in that state, will be

found very sweet and pleasant, and may be eaten without the least danger; and it is the custom in the east, to carry a plate of them to the table, after dinner, with other fruits.

I intend, this year, to keep apart a small quantity of opium from each coloured poppy, to find out if any one, more than another, produces a greater quantity, or of greater strength, and shall save seeds of each, to sow separately the next spring. I am of opinion, that numbers of inclosures, taken from hills, in a south aspect, with a very little expence, may be brought into a proper state for the growth of poppies.

I should think, that an instrument may be made, of a concave form, with four or five pointed lancets, about the twelfth or fourteenth part of an inch, to make the incisions at once, and likewise something of the rake kind, so that the three drills, which I have directed to be made in each bed, may be performed at the same time.

By a calculation which I have made, supposing one poppy growing in one square foot of earth, and producing one grain of opium, more than fifty pounds will be collected from one statute-acre of land; but upon recollecting, that one poppy produces from three or four to ten heads, and in each head from six to ten incisions are made, and I am positive, from many of them, (I mean one incision), the last year I took away two or three grains; what must then be the produce? Opium is now twenty-two shillings the pound.

I am, &c.

(Signed) JOHN BALL.

Williton, 2d June, 1795.

In a subsequent letter, Mr. Ball states, that the experiment of transplanting did not succeed, not one plant coming to perfection. The pods should be about the size of a walnut before the incision is made. The dried heads from London, being three times as big, must afford much more opium.

In another subsequent letter, Mr. Ball acquaints the Society, that double or semi-double poppies gave more than twice of what is collected from the single. One poppy, which had twenty-eight heads, afforded above thirty grains of opium. It was of the semi-double kind, and the opium was of a better quality than from single heads. The article closes with three letters of testimonies, namely, from Dr. Latham, Dr. Pearson, and Mr. G. Wilson, of Covent-Garden, who all agree, that the English is at least equal in its efficacy to the best foreign opium.

ARTICLE II.

Analysis of a Memoir of Citizen BONHOMME, *on the Nature and Treatment of Rachitis, or the Rickets.**

[*From Mr. Nicholson's Journal of Nat. Philos. Chem. and the Arts.*]

SINCE the object of the Society of Medicine, in the offer of its prizes, is to bring our knowledge of the healing art to the greatest degree of precision and accuracy of which it is susceptible, this company must necessarily direct its attention to the progress of the chemical analysis of animal matters, and the information which sooner or later it must afford respecting the nature and treatment of many disorders.

Those disorders which alter the composition of the fluids and the consistence of the solids, are assuredly the first which ought to be determined by chemical research. The rachitis is of this number. The change which the bones undergo in this disorder, has long been attributed to the action of an acid on their substance; but this opinion was grounded on mere supposition and remote analogy. The subject is treated in a new manner in the memoir, of which the Society has directed us to present the results; and the experiments, as well as the observations upon which the author grounds his inferences, present to our view matters of fact sufficiently remarkable to afford a presumption that new experiments will confirm their truth. We announce them on the present occasion with expressions of doubt, because these are the expressions which the wisdom and modesty of the author have suggested, and because we think with him, that facts of this nature cannot be stated as if fully proved, but in consequence of multiplied experiments.

The principal notions which constitute the basis of this memoir are the following:

1. According to the author, the nature of the rachitic disorder arises on the one hand from the developement of an acid approaching, in its properties, to the vegetable acids, particularly the oxalic; and on the other from the defect of phosphoric acid, of which the combination with the animal calcareous earth forms the natural basis of the bones, and gives them their solidity.

Whence it follows, that the indication resulting from this proposition, if once adopted, would be, that the treatment of rachitis must depend on two principal points, namely, to prevent the de-

* This memoir was read to the National Society of Medicine at Paris. The analysis was made by Hallé, and is inserted in the seventeenth volume of the Annales de Chimie, whence this translation is made.

velopement of the oxalic acid, and to re-establish the combination of the phosphoric acid with the basis of the bones to which they owe their solidity.

2. The author proves, by experiments and observations, in the first place, that alkaline lotions of the parts affected with rachitis contribute to their cure; next, that the calcareous phosphate taken internally is really transmitted by the lymphatic passages, and contributes to ossification; and lastly, that the internal use of calcareous phosphate, whether alone or combined with the phosphate of soda, powerfully contributes to restore the natural proportions in the substance of the bones, and accelerate the cure of rachitis.

On the present occasion we shall only collect the proof of these fundamental facts, which form the absolutely new part of this memoir, in which the author has besides inserted an excellent abridgement of all that had been ascertained before him on the nature of the bones, the rachitis, and the treatment of this disorder.

With regard to the first parts, the author endeavours to establish these two propositions: 1. That the calcareous phosphate is wanting in the bones of those who are disordered with rachitis. 2. That the developement of oxalic acid is the cause of this alteration.

We must not conceal, that this ingenious part of his memoir contains rather views than absolute proofs of the nature of the rachitic acid. The author himself declares, that he was not provided with the necessary means to establish an exact and complete analysis. He therefore presents his ideas in this respect, merely as conjectures approaching to the truth.

The effect of the action of acids upon bones, was before known; that is to say, that when deprived of calcareous phosphate, and reduced to the gelatinous parenchyma which forms one of their elements, they lose their consistence and become flexible. Hence it was already conjectured by various physicians, that the rachitis was the effect of a peculiar acid.

A disposition to acescence in the first passages is observable in all infants. The odour which characterizes this acescence is often manifest in their breath, and even their perspiration. The bile corrects this disposition; but in general the bile is wanting in rachitic infants. It does not colour their excrements, and the acids accordingly are developed in a very decided manner. They disturb the circulation, and attack and soften the bones. As it is by defect of animalization that these acids develope themselves, it follows that their character is analogous to the fermentescible vegetable acids, and more or less to the oxalic acid; and that, on the contrary, the animal acid or phosphoric acid ceases to be formed, and to unite with the animal calcareous earth; whence they are

deprived of the principle of their solidity. This is the theory of Citizen Bonhomme.

In order to establish this doctrine upon precise experiments, it was requisite to analise rachitic bones comparatively with those of healthy individuals of the same age; and as it is known that the urine of rachitic subjects deposits a great quantity of a substance of sparing solubility and earthy appearance, it would have been advantageous to have joined a complete analysis of this urine and its sediment.

Citizen Bonhomme not being provided with the means sufficient to make these analyses, and being besides of opinion that such rachitic bones as are destroyed by this malady exist in a progressive state of change, which might render their analysis scarcely susceptible of comparison, limited himself to a collection of some of the most remarkable phenomena of the urine of the aged, the adult, and infants in the healthy state, of infants in the rachitic state, and of patients after the perfect cure of this disorder. From these observations he has deduced several important results.

It is known that when the urine contains disengaged phosphoric acid, as happens to aged individuals, and in some peculiar circumstances of the system, if lime water be poured in, there is a speedy deposition of calcareous phosphate. It is also known, that when a solution of the nitrate of mercury is poured to the fresh urine of adults, a rose-coloured precipitate is formed, which is a phosphate of mercury produced by the decomposition of the phosphates contained in the urine. These two proofs are therefore extremely proper to ascertain the presence of phosphoric acid, whether free or combined, in a fluid which in its natural state contains a remarkable proportion. Besides this principle, the urine deposits more or less of sediment, either gelatinous or of an earthy appearance; and lastly, by evaporation, a saponaceous and saline extract, in greater or less abundance, is obtained by evaporation. By means of these four methods of examination, the author has ascertained the following facts:

1. In the healthy state, the sediment naturally deposited by urine is almost totally gelatinous in the infant and the adult, and in the aged individual it is surcharged with an abundant sediment of an earthy appearance similar to the earth of bones, which consequently is calcareous phosphate.

2. The quantity of brown saponaceous saline extract afforded by evaporation is greater in proportion to the age.

3. The presence of disengaged phosphoric acid, as shewn by lime water, is none in the urine of infants, scarcely perceptible in that of adults, but very remarkable in that of old men. For two ounces of this last urine afforded by this means ten grains of phosphate of lime.

4. The decomposition of the phosphates by nitrate of mercury is not seen in the urine of infants; an abundant precipitate of a light rose-colour is produced in this way, from the urine of adults; and in that of old men, this precipitate is always of a grey colour, and very abundant.

Hence Citizen Bonhomme concludes, that the phosphoric acid, whether at liberty or combined, does exist in the urine of healthy individuals in proportion to the destruction of the solids by age, and that it increases with the age.

With regard to the urine of rachitic subjects, the most remarkable facts are, 1. The abundant and apparently earthy sediment it deposits (spontaneously) is different from that of old men, by its colour, which is grey and does not resemble phosphate of lime, and also by its much greater quantity. For a pound of this urine let fall two gros,* whereas the same quantity of the urine of old men deposited only 45 grains.

2. The extract left by evaporation is likewise much more considerable than in other urine. It is one third more in quantity than the extract afforded even by the urine of aged persons.

From these two first observations it follows, that the solids in rachitic subjects are destroyed with much more rapidity than even in old men; and that they afford a much more abundant portion of waste to the urine.

3. The light deposition occasioned by lime water in the urine of rachitic subjects is very small in quantity, brown, gelatinous when fresh, and pulverulent when dry. It does not at all resemble calcareous phosphate.

4. The deposition formed by the solution of mercurial nitrate is not abundant, neither of a rose-colour, as in the urine of adults, nor grey like that of men. It is always white, and consequently has no external resemblance to the phosphate of mercury. The author affirms that it resembles a mercurial oxalate.

Lastly, the urine of the same rachitic subjects, when cured, exhibits again all the characters observed in the urine of healthy children.

We shall not add to the reflections of the author. In effect, though these first observations are curious, they are incomplete. We offer them to physicians simply as the elements of an investigation which it is of importance to continue and bring to perfection. We shall therefore proceed to the curative and experimental parts of the memoir.

We must remark, however, in this place, that the author presents in his work a judicious and methodical exposition of the whole treatment of the rachitis by other physicians; that he esti-

* About two drachms.

mates the value of each remedy, and every part of the treatment, from the circumstances to which they are applicable, the degrees of the malady in which they are to be admitted, and the indications they answer. Setting aside, therefore, every thing which is not peculiarly his own, we shall in this place attend only to that which relates to the use and effects of calcareous phosphate and alkaline lotions.

One of the facts which it was of the utmost importance to establish, was the transition of the calcareous phosphate from the intestinal passages, into those of circulation and secretion. Fourcroy had already well ascertained that the serum of milk contains this salt naturally. Vauquelin had proved its existence, as well as that of pure soda, in the seminal fluid; but was it possible that it could pass unaltered from the stomach and intestines into the vessels which contain the blood and lymph? Could it by this means apply itself to the bones? This was to be ascertained by experiments.

The following are the experiments by which Citizen Bonhomme appears to have succeeded in proving this truth. I shall transcribe his own words.

" I caused several young fowls of the same incubation to be fed " in different manners. Some received the usual food without " any mixture; others received daily a certain quantity of calcare- " ous phosphate mixed, in the same paste as formed the sup- " port of the others; and lastly, one of them was fed with varia- " tions in the use of the mixture: the calcareous phosphate was " sometimes given and sometimes suspended. When these fowls, " after two months, had acquired their ordinary growth, I examin- " ed and carefully compared the state of their bones. The pro- " gress of the ossification in the epiphyses was various, according " to the nature of the food the animal had received. The bones " of the last fowl, which had received the phosphate only from " time to time, were rather more advanced than the bones of those " which had been fed without mixture. The bones of those fowls " which had been habitually fed with the mixture were evidently " more solid, and their epiphyses were much less perceptible. " Simple inspection was sufficient to shew these differences when " the bones were mixed together.

" I had fed several young fowls of the same incubation accord- " ing to another plan. Some were fed on a simple paste, without " mixture; for others it was mixed with pulverised madder-root; " and a third composition was made of this last paste and calca- " reous phosphate. This was also given habitually to other fowls. " When, after two months, I examined the progress of ossification " in the bones of these different animals, I easily perceived the red " traces of the madder in the ossified parts of all those which had

" used it; but I observed that the ossification was not more ad-
" vanced by the simple mixture of this root than by the ordinary
" food; on the contrary, the bones of those fowls which had swal-
" lowed the phosphate mixed with madder were much more solid
" than the others. The red colour served admirably to distinguish
" the extremities of the long bones from their epiphyses. After
" an exact comparison, there could be no doubt of the efficacy
" of calcareous phosphate in favour of the progress of ossification.
" The virtue of the madder seemed confined to that of giving
" colour to the ossified parts."

From these experiments, it was natural to make trial of calcareous phosphate in addition to the remedies made use of in the treatment of rachitic subjects. Here follows what the author himself says, after having spoken of the exaggerated praises given by Haen to the use of oyster-shells (ostracodermata) in the treatment of rachitis.

" Without pretending," says he, " to a result so brilliant as that
" announced by Haen, I can affirm that the calcareous phosphate
" has succeeded very well in the greatest number of rachitic sub-
" jects to whom I have given it. I shall not multiply my ac-
" counts of successful cases in this place, but shall relate only two
" remarkable instances.

" The daughter of Mr. Ranchon, watch-maker, aged two years
" and a half, walked with a feeble and tottering pace, and the ex-
" tremities of all her bones presented epiphyses very prominent.
" In this situation she exhibited the appearance of imperfect rachi-
" tis, or the first period of this disorder. Alkaline lotions, which
" I immediately advised, were attended with a good effect. Her
" sleep became more firm; and as the first passages were in a good
" state, I gave, without internal preparation, one scruple of a mix-
" ture of equal parts of phosphate of lime and phosphate of soda
" twice a-day. In the course of three weeks her legs were per-
" fectly restored; and this amiable infant has ever since had the
" satisfaction to run with spirit and agility.

" A female infant, of the name of Boiard, aged four years, had
" experienced from her birth the most decided symptoms of rachi-
" tis. The protuberance of the epiphyses and tumefaction of the
" abdomen first indicated the disease. The impossibility of sup-
" porting herself and walking at the usual age confirmed these
" unfortunate symptoms. By degrees the glands of the neck and
" of the mesentery became swelled; the teeth were blackened, be-
" came carious, and were not replaced. This situation became
" still more afflicting by crises almost periodical at an interval of
" three or four weeks. At these afflicting periods, a fever of con-
" siderable strength, cardialgia, and even convulsions, particularly
" in the night, were observed. The termination of each paroxysm

" was announced or ascertained by abundant stools, and the eva-
" cuation of urine strongly charged with an earthy sediment.
" The imprudent exhibition of a purge at the beginning of one
" of these crises had nearly deprived the patient of her life. In
" this state it was that I beheld her for the first time in the month
" of January, 1791. The alkaline lotion was the only remedy
" the mother adopted in the first instance, and it produced a re-
" markable effect. After eight days the infant was so much better
" as to be able to support herself. The remedy was then laid
" aside, and eight days afterwards the child was incapable of stand-
" ing without support. The use of the alkaline solution being
" renewed, was attended with the same success, and its discon-
" tinuance was again followed by the complete return of all the
" symptoms. In the first days of March, the other remedies I had
" advised were exhibited. The constipation which had always
" existed became less, and the following crisis was effected without
" pain. And at length the convulsions, the pains, and the crises
" disappeared; but the impossibility of walking still remained. At
" this time, namely, on the second of May, I gave the child the
" phosphate of soda and calcareous phosphate mixed together, in
" the dose of half a dram twice a-day. At the end of the month
" she was able to stand upright, leaning against a chair, and the
" swellings began to diminish. She continued for a long time
" afterwards to take the mixture of the phosphates. I likewise
" gave her occasionally one grain of the extract of bile, prepared
" with spirit of wine; and at length, in the month of July, I had
" the pleasure to see the patient run and play in the middle of the
" street with the other children of her own age, &c.

" J. B. Magné, aged two years and a half, appeared strong
" and well formed. A general rachitis manifested itself rapidly
" in his constitution, without apparent cause. He soon became
" incapable of walking, and his relations learned from his play-
" fellows that he had frequently evacuated white and thick urine.
" Most of the remedies and methods proposed by different authors
" were made use of. At length, discouraged at so many useless
" trials, the parents gave up every remedy, and the child remained
" incapable of walking. The bones of the legs were softened and
" bent. At the age of four years and a half, young Magné had
" the small-pox; the disorder was acute, but terminated happily
" without any particular attention. When the desquamation was
" complete, the child was no longer capable of supporting himself.
" At this period he was brought hither, and I was consulted. I
" observed that part of the bones were so much softened as to
" occasion variations and even violent pain in his walk. I ad-
" vised a purgative, with alkaline lotions and the use of calca-
" reous phosphate, and a proper regimen. Eight days afterwards,

" the whole surface of the skin was covered with an infinity of " small blisters, resembling the itch. My prescriptions were regu- " larly continued, and in one month the solidity of the bones was " entirely secured. For more than a year he has experienced no " relapse. In this case we may remark the inutility of the usual " remedies, the advantage of cutaneous eruptions, and the efficacy " of the treatment I propose."

The incurvated spine, (though apparently confined to the vertebræ, which bones are not only affected with preternatural enlargement, but frequently also with caries) is this disorder, I say, to be regarded as analogous to rachitis, or at least to accidental rachitis? Both have been produced by the repercussion of cutaneous eruptions. Citizen Bonhomme relates observations in which the two affections are so combined that they appear to form one single disorder, varied only according to the parts affected. Is the use of calcareous phosphate applicable to the treatment of the vertebral disease, to complete and accelerate the frequently partial process of other remedies? The author thinks that the following observation is conclusive in this respect:

" At the end of the month of February, 1790," says this physician, " a rachitic child, aged eight years (J. Esprit Guinde), " was presented to me in the General Hospital of this town. He " had been for several weeks among the patients under the care of " the surgeon. At the first moment a prominence of the first " dorsal vertebræ was observed, with a considerable weakness of " the legs. A large blistering plaister had been applied over the " commencing gibbosity, and the blister was kept open by powder " of cantharides for more than a month. The situation of the " infant was not amended. I remarked in this patient all the cha- " racters of the disease described by Pott. I concluded that the " blister had produced as great a discharge as was necessary, and " that it was more essential to oppose the progress of the rachitic " habit. I ordered the whole of the spine to be carefully washed " three times a-day with an alkaline and aromatic lixivium. The " phosphate of soda was mixed with twice as much powder of " burnt hartshorn. Of this I gave to the child one scruple twice " a-day, in a spoonful of soup. After the first week he was able " to walk with assistance; by degrees the solidity of his legs was " re-established, and the spine appeared to recover itself. And at " length, on the 31st of December, when I quitted the service of " that hospital, the boy thought himself sufficiently recovered to " return to his friends.

" Eight or nine months afterwards, I found this unfortunate " child in another hospital appropriated to the reception of scro- " phulous patients. From his answers to the questions I proposed, " I found that the treatment of the month of December had not

" been continued long enough to destroy the principle of the ra-
" chitis; that the disorder had been, as it were, subdued during
" six months, but that coarse food had developed it again. And
" lastly, that the swelling of certain glands, and a diminution of
" the solidity of several ribs and of the humerus of the right side,
" were the effects of its renewed activity. I ordered purgatives
" to be repeated every eight days, the alkaline lotion, and the mix-
" ture of the phosphate of lime and soda; in addition to which I
" prescribed the use of the saponaceous and mercurial pills. The
" efficacy of these remedies was very sensible. The advances of
" the rachitic disorder were stopped; the evacuations were kept
" up; *the distortion of the ribs and of the humerus disappeared;* but
" the original gibbosity remained. This deformity, which could
" not be effaced, did not diminish the pleasure I had to see this child
" perfectly cured after three months treatment."

In most of these observations mention is made of alkaline lotions and their beneficial effects. The following is the author's own account:

" In ordinary cases of rachitis, particularly at the commence-
" ment of the disorder, it is of advantage to use a simple solution
" of pot-ash to wash the parts affected. This solution is made by
" dissolving from half an ounce to an ounce of purified pot-ash*
" in a pound of distilled or very pure spring-water. When it is
" to be used, the skin must first be rubbed with a dry cloth, or a
" piece of fine flannel. After this precaution, the diseased extre-
" mities are to be washed carefully with the warm solution, and at
" length wiped, so as to leave no trace of moisture. This prac-
" tice and washing must be repeated at least twice a-day. I can
" affirm, from repeated trials, that it will soon be attended with
" success.

" The solution of pot-ash is not very costly; nevertheless, the
" habitual and long continued use of this remedy for a rachitic
" patient in the second period, becomes expensive to poor parents.
" The lixivium of wood-ashes, which has been used for washing
" fine linen, in which aromatic plants may be infused, becomes
" of remarkable utility for the rachitic children of the poor. I

* M. Hallé, in a note on this paſſage, obſerves, that pure pot-aſh, or the vegetable alkali, is a moſt powerful cauſtic, and cannot be uſed in theſe proportions. He found a ſolution of only one-eighth part of the ſalt here indicated was too ſtrong a lotion for the ſkin of an infant which was very irritable. Citizen Bonhomme, upon inquiry made, acquainted him that the pot-aſh he uſed was that of the ſhops, which is very far from being in a cauſtic ſtate. Probably it may be the ſame as the common ſalt of tartar of moſt of our ſhops in London, which is nothing but pot-aſh or pearl-aſh diſſolved in water, then filtered, and the water driven off by evaporation. It accordingly retains all its ſaline impurities. N.

" have seen the most decided success result from its use. Several " children, who, after having walked alone, found a difficulty in " supporting themselves, were washed two or three times a-day " with this lixivium, and in the space of one or two weeks they " walked with ease and agility, &c.

" I have seen various instances of children cured of their dis- " position to rachitis merely by washing with alkaline liquids; but " in most cases I have thought it necessary to secure the first suc- " cess by other remedies. When the rachitis has already made " some progress, it is evident that all the remedies must be united, " and steadily continued. The alkaline lotion is a remedy the " more preferable, as it is not at all disgusting, and scarcely in any " respect troublesome to children; but the internal remedies pos- " sess superior efficacy."

If the facts here announced should be confirmed by further experience, might we not hope to obtain similar advantage in such other diseases as attack the substance of the bones, and probably have more analogy to the rachitis than has been imagined? Such are the *spina ventosa*, scrophulous tumors and caries, the difficulties in the formation of the bony process, after fractures, slowness and irregularities of dentition, &c. These questions, highly deserving of investigation, are produced by the author of this memoir as consequences of what he has related. He likewise communicates some useful notions respecting the cases in which the other combinations of phosphoric acid may be employed, such as the phosphates of iron and of mercury, concerning which experience has yet afforded him no information.

With the same candour and diffidence as is displayed by the author of this memoir, we present his experiments as essays worthy of the attention of enlightened physicians. We have no doubt but the author will direct his attention in future to extend his proofs and increase the degree of precision and evidence. And even if others should go beyond him in this important inquiry, he will nevertheless enjoy the honour of having begun it.

Let us conclude this abstract by a few reflections. It seems to us, that a multitude of ideas must present themselves to him who shall meditate on the facts here displayed. Without dwelling on those which are still too hypothetical, the single fact of the transition of calcareous phosphate through the passages of circulation, and consequently its solution in the fluids, and its application to the substance of the bones, deserves the highest attention. The means which nature employs to render the calcareous phosphate soluble are well entitled to the researches of chemists: without doubt its combination with soda may have some part in this effect; but it is not less important, in this place, as a remarkable phenomenon in the animal economy, which is essentially connected with

nutrition, and the developement of our organs. If we compare the experiments of Vauquelin on the seminal fluid, with those of Fourcroy on the serosity of milk, and more especially a remarkable fact communicated to us by this last chemist, namely, that the nearer the milk of the human female approaches to the period of parturition, the more the serosity is charged with calcareous phosphate; and the more remote, on the contrary, the time is, from that moment, the less is the proportion of that substance, while the other nutritive parts of which it is composed are augmented in an inverse ratio;—if we consider that at the epocha of gestation and parturition a diminution of solidity takes place in all the articulations of the mother, and a relaxation of the cartilages; that fractures of the bones at this time are most particularly slow in uniting by the formation of the callosity; that it is at this very time of change in the osseous system that the milk becomes charged with calcareous phosphate, which it loses in proportion as the infant and the mother become more removed from the time of the birth; so that the fluids which contribute most to the formation, the growth, and the nutrition of the fœtus, contain in themselves the essential principle of solidity, the elements of ossification; and lastly, that it is not till this ossification is very distinct, and the digestive organs of the infant are sufficiently strengthened to answer the purposes and the work of animalization, that the basis disappears from the milk of the mother;—we shall be compelled to acknowledge a particular direction of nature, by which the calcareous phosphate becomes the matter of a peculiar secretion, essentially ordained to give firmness to our organs, and to consolidate the first elements of man.

May these reflections impart to medical men a conviction how truly important the physical sciences may become to their researches, though too often regarded as merely accessary to medical science! May they see the advantage and necessity of studying the progress of nature in these respects! For it is by these sciences, and more especially by the improvements of animal analysis, which are rapidly advancing, that we may probably expect, in a short time, to diminish the uncertainty of a large number of our methods of practice, and, to speak freely, the too frequent ambiguity of our conjectures.

ARTICLE III.

Cases of the Anti-syphilitic Efficacy of the Nitric Acid, by Mr. HAMMICK.

[*From Dr. Beddoes' Reports, &c.**]

CASE I.

GEORGE HALL, a Marine, thirty-nine years of age, was received into the Royal Hospital at Plymouth, on the seventeenth day of April, 1797, for a venereal complaint, which he had contracted about three weeks before; at this time he had a large, irregular, foul chancre on the lower part of the penis near the scrotum, with an enlargement in the right groin; had never taken any medicine, or applied any thing to the chancre itself: the next day, the 18th of April, he was ordered the following drink;

℞
Acidi nitrosi diluti drachmas ij.
Succi limonis unciam i.
Aquæ fontanæ libras ii.
M. bibat quotidie.

The ulcer was dressed with the simple white ointment: he continued his drink daily to the third of May, when the diluted nitric acid was changed for the same quantity undiluted, which he took, with the addition of syrup, till the eleventh day of May; when his chancre was healed, the enlargement in his groin could not be felt, and in every respect he became well: he was discharged to quarters on that day to go on duty.

N. B. This man never took a grain of mercury.

CASE II.

THOMAS HOMEWOOD, Seaman, twenty-six years of age, was received into this Hospital on the twenty-ninth day of March, 1797, for a venereal complaint, which he had contracted about a month before. He had taken different medicines without effect, for it, on board; the appearance of the disease was a very large

* See Medical Repository, p. 260.

and deep chancre, extending all the length of the penis on the back part; a large and extremely inflamed bubo in each groin, with a profuse discharge of matter from the urethra, accompanied with great heat in passing his urine. His buboes were ordered to be fomented and poulticed twice a day, and two drachms of the strong mercurial ointment to be well rubbed in on the thighs at night; which applications were continued to the 2d of April, when his buboes (now ready to suppurate) were touched with the lapis infernalis, and the eschars were thrown off on the 5th. The next night he used the friction again, and continued it to the 10th, when I found him very weak and low, with a violent cough and much expectoration of thick phlegm streaked with blood, profuse sweats, and such extreme debility, as not to be able to raise himself from his pillow, attended with diarrhœa. The chancre and buboes continuing at the same time very foul, the friction was discontinued, and he was the next day ordered the following drink:

℞
Acidi nitrosi drachmas ij.
Syrupi simplicis uncias viii.
Aquæ fontanæ libras ij.
M. Capiat quotidie.

The day after, finding himself somewhat better, the drink was continued, and from the above alarming symptoms yielding, and an entire alteration taking place both in his health and appearance of the ulcers, he took it to the 10th of May, when he complained the drink vomited him. The nitric acid was then reduced to one drachm daily, which he drank without any uneasy sensation in his stomach, and continued it in that proportion to the 30th of May; when his buboes and chancre being healed, and all his venereal complaints entirely gone, the drink was no longer used, and he was discharged from the Royal Hospital on the 5th day of June, in order to join his ship.

CASE III.

WILLIAM FRANKLIN, Seaman, thirty-six years of age, was received into this Hospital on the 28th day of May, 1797, for a venereal complaint, which he said had made its appearance two months before; for which he had taken a good deal of mercurial medicines on board, without the least effect: in fact, he was

now, he said, worse than at any former period. On examining him, I found a bubo which had suppurated some time, and appeared to be in a spreading state; chancres on the penis; excoriations and ulcers extended to the scrotum and round the anus, which gave him such intense pain, as to oblige him to keep his bed, only getting out once a day in order to have it made. He was ordered the following drink:

℞
Acidi nitrosi drachm. i ss.
Syrupi simplicis uncias viii.
Decocti lignorum libras ij.
M. bibat quotidie.

The excoriated parts were kept clean. He took this drink to the twenty-second day of June, when his bubo, chancres, and excoriations being healed, and finding himself in all respects well, he was discharged that day from the Royal Hospital in order to join his ship.

CASE IV.

JOHN WILLIAMS, a Marine, twenty-four years of age, was received into this Hospital, on the 1st day of May, 1797, for a venereal complaint, which he had contracted ten days before. He had now enlargements of the glands in each groin, and a chancre on the prepuce; had never taken any medicine, or made any application to it; the swelling in his right groin was the size of an egg, and the other in his left, somewhat smaller. He was ordered that day the following drink:

℞
Acidi nitrosi drachmas ij.
Syrupi simplicis uncias viii.
Aquæ fontanæ libras ij.
M. Bibat quotidie.

He was strictly forbidden to apply any thing to the groins: he took the nitric drink that day, and continued it in the same proportion daily to the 8th day of June, when the indurations were entirely dispersed (not even the smallest hardness to be felt) and the chancre healed. He was discharged that day, viz. the 8th day of June, to go to quarters.

N. B. This man had not taken any mercury.

THE

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ADVERTISEMENT.

IT was the design of the Editors to give, with the present Number of the REPOSITORY, *a general Title-page, Index, and List of Subscribers. Two circumstances have prevented its execution at this time:—A disappointment in respect to paper, which delayed the printing till there was only time for completing this number, and the non-reception of the subscription-papers from several parts of the country. The delivery, therefore, of the Title-page, &c. is necessarily deferred till the publication of the first number of the second volume, which they will certainly accompany; and, in the mean time, the Editors once more request that the names of those Subscribers, which hitherto have not been sent to them, may be forwarded.*

New-York, May 1, 1798.

ERRATA.

Page 460, line 13 from the bottom, for "more" read *mere*.

Page 496 is erroneously marked 471.

MEDICAL REPOSITORY.

VOL. I.—No. IV.

ARTICLE I.

A SKETCH OF THE MINERALOGICAL HISTORY OF THE STATE OF NEW-YORK.

By SAMUEL L. MITCHILL.

[*Continued from p.* 314.]

5. *The Alluvial Tracts.*

BY the term *alluvial*, is understood, not merely the substances brought down to the vallies, by the wash of rivulets and rains, and the crumbling to dust of the hills and mountains, but the matters formed from the growth of plants, in low, swampy, and intervale spaces, adjacent to lakes and rivers.

And, first, of the vegetable matter collected in wet and marshy places. This is frequently of an inflammable nature, and answers very well for fuel. When used for burning, it is called peat or turf. If employed in fertilizing the ground, it is termed swamp manure. The true history of this substance has not been generally well understood, for it has been commonly classed with *mineral* substances, though Mr. Kirwan, who retains it in his mineralogy, (Elements, &c. Part iii. sp. xi. and xii.) has removed it from the class of *earths*, where it had been placed before, to the class of *inflammables*. "There are," says he, "two sorts of inflammable substances, known by the name of 'peat.' The first "and principal is of a brown or black colour, found in a moory "ground, and when fresh, of a viscid consistence, but hardens, "by exposure to the air. It consists of clay, mixed with calcareous earth and pyrites, and sometimes contains common salt. "While soft, it is formed into oblong pieces, and the pyritaceous "and stony matters are separated. When distilled, it affords water, acid, oil, and volatile alkali, and its ashes contain a small "proportion of fixed alkali. They are either white or red, according as it contains more or less ochre or pyrites. It is found "in Scotland, Holland, and Germany. Another sort is found "near Newberry, in Berkshire. It contains but little earth, but

" consists chiefly of wood-branches, twigs, roots of trees, with " leaves, grass, straw, and weeds." " *Turf*," continues he, " con- " sists of mould, interwoven with the roots of vegetables. When " these roots are of the bulbous kind, or, in large proportion, they " form the looser and worst kind of turf; but when mixed with " a considerable proportion of peat, form what is called *Stone-* " *turf*. It at first hardens, but at last crumbles, by long expo- " sure to the air." The compilers of the Encyclopædia Britannica (page 1896.) have inserted the following remarks on this substance: " There are very considerable varieties of *peat*, pro- " ceeding probably from the admixture of different minerals; for " the substance of peat is plainly of vegetable origin. Whence it " is found to answer for smelting of ores, and the reduction of " metallic calces, nearly in the same manner as the coals of wood, " &c."

An accidental occurrence satisfied the mind of the Commissioner, as to the particular plant entering largely into the constitution of peat-bogs. Some time in the year 1786, as he was travelling in the western parts of Scotland, after his return from the Highlands, in company with two of his friends, they directed their walk on foot from Greenock, across the country to Paisley. During this excursion, they crossed an extensive bog of peat or turf, not far to the westward of this town; and there remarked for the first time, that the uppermost stratum of peat consisted of small plants, which, though dead, were in a state of intire preservation. Their particular shape, their genus and species, could be plainly distinguished. The principal among them was the *sphagnum palustre*, which, upon examination, constituted almost the whole of that deep and extensive bog. On examining beds of turf in America, the same observation has been verified by numerous observations of these plants, in their living as well as decayed state. He thinks himself warranted in concluding the basis of peat and turf to be the sort of moss called, by Linnæus, sphagnum palustre, (Sp. Plantar. p. 1570.) " which," that author says, " grows in the " deep bogs and fens of Europe."

This plant delights to grow in wet, low, or swampy places, and requires for its support a plentiful supply of water. It will also thrive in elevated situations, if sufficiently moistened. For, on high mountains, where water is so plentifully condensed as to preserve constant wetness, the sphagnum grows vigorously. When a plantation of these vegetables is formed on a low-land bottom, the parent plants, after producing and maturing their seeds, die, and form a soil for their offspring to grow upon; for as it has been long ago ascertained, that some vegetables can grow without being rooted in *earth*, it is here found, that *dead moss* answers all the purposes of a soil for the new generation of moss to grow upon.

After a while, this crop of plants dies, and adds to the increase of the vegetable matter beneath; and thus, from year to year, the process goes on, the old plants decaying, and forming a soil for the seeds they left to sprout in; until, by degrees, a bog of moss be formed. And this happens, because the plant which had lived in water does not very speedily corrupt in it, but continues to accumulate layer upon layer. It hence follows, that the depth of the bog will be proportional to the number of successive decays of these swampy productions, and to the circumstances favourable to their thriftiness.

In its fresh and living state, it retains water like a sponge; and, on account of its being so retentive of moisture, it becomes a soil for aquatic plants of various sorts, which absorb nourishment from the water, and other matters inherent in the moss. These vegetables taking root, growing in the peat, and decaying there, give to it the mingled appearance of roots, leaves, stalks, branches, bark, trees, and other extraneous substances, so frequently blended with it.

When peat is left to itself, to grow in the natural way, it frequently rises many feet above the original surface of earth; and the stratum continues to enlarge and thicken, as long as there is water enough to keep the moss alive. When this fails, the plants die, and the process stops; for, after it is raised considerably above the level of the springs that feed it, the rain of the season is neither regular nor copious enough to supply the demand both of it and the plants rooted on it; they consequently perish. Therefore, the ditching of swamps and meadows where the sphagnum grows, will drain off its requisite supply of water, and quickly destroy it; and it is accordingly observed, that where such low lands are, by art, rendered fit for manuring, pasture, or tillage, the growth of peat is stopped, and a sward of grasses is formed above the inflammable matters, which is thereafter wholly concealed from sight, and is never to be seen until after the sod is dug away.

As the peat is thus formed, layer over layer, in the course of successive vegetations, it can be easily explained how trunks of trees, fossil wood, and bodies and bones of animals, came to be buried so deep below the present surface; because, at the same time, when the trees fell, and animals died, in the places where they are now found, they were upon the top, and, by the perpetual growth of the plants around, they have, in many places, become covered to a great depth.

If there is any difference between peat and turf, it consists in the degree of putrefaction, to which the former has been subjected more completely than the latter; and has lost, therefore more of a vegetable appearance, and become more completely divested of its organic nature. As the other vegetables growing in the

sphagnum, have each of them somewhat of peculiar qualities, it must follow, that *turf*, when chemically examined, will afford a greater difference of result, and this variety will be rendered yet greater by the mixture of earths, stones, and other mineral substances, which the winds and torrents have carried among it.

From all these particulars it will be apparent, that both turf and peat, when pure, ought to be considered merely as a residuum of decayed vegetables. That the minerals frequently found in it, are foreign and casual admixtures, by no means essential to its nature, and that it ought not to be considered as a mineral production, nor classed as such in the systems: but that the clay, marl, pyrites, and other fossil bodies found among it, should be referred to their proper places in the mineralogical arrangement.

On this subject, there appears a propriety in suggesting a few practical hints. As wood grows scarce, and our State is not known to abound in coal, the sphagnum might be cultivated for fuel in wet grounds and swamps that now lie waste, and perhaps will never be cultivated. If this should ever be attended to as an economical matter, the cultivator should not suffer cattle to tread it, nor foreign plants to overgrow it, nor water to be drained from it; but clear the swamp of the peat as soon as it has risen above the moistening influence of the springs, and be ever careful to remove the upper paring, containing the living plants, to some wet and suitable spot for propagation.

But though the sphagnum has so much agency in filling up wet and low places, it is by no means the only plant which acts in that way. There are many other small and obscure vegetables, which, by their numbers, add considerably to the bulk of matter accumulated in these spots. Many of the grasses taking root, and increasing upon such bottoms, form, in process of time, bogs, hassocks, or a sort of sward, which contribute no less to the diversity, than to the increase of these swampy productions. When shrubs and trees, of various kinds, as well as animal plants, gain an establishment in these soils, the qualities and appearance of the latter undergo additional variation.

In this way are many considerable portions of sand, furnished with a covering of vegetable matter, with very little foreign admixture. But a more common case is, that in the neighbourhood of low places, there are high grounds and mountains, from which there is a constant descent of the matters of which they consist to the vallies.

Whatever may have been the cause of the inequalities at present existing on the surface of the globe, observation teaches, that the hills and mountains are generally in a crumbling condition, and descending gradually to the plains below. The chief agents in this process, which is incessantly changing the face of things, are,

1. The undermining of waters. 2. The washing of rains and torrents; and, 3. The irresistible force of frost.

The undermining operation of the ocean water, is very evident on the south side of Montauk-point, at the east end, and on both sides of Cow-bay, on the north side of Long-Island, and in many other places which it would be easy to enumerate. Instances of the effect of streams and rivers, in altering the disposition of the solid materials through which they run, occur at Passaick Falls, above Second River, in New-Jersey, where huge masses of rocks are evidently displaced; at Kaat's-Kill, where part of a hill has fallen down; and in various places in the Blue Mountains, where, after the more soft, moveable substances that had lain below, have been carried off by the rains and floods, solid fragments of the materials that are deprived of their support, tumble down, and seek the level of the plains.

By the force of waters, descending from hills and mountains, the firm materials forming the channels and sides of the streams are incessantly wearing away. Sandy and moveable matters, washed by rains from the mountain tops, leave the more durable rocks behind, in all their rudeness and nakedness. Every shower that falls denudes more and more of the rocks, by carrying down constantly the loose materials that cover them. Each rill and brook, however small or insignificant, that trickles along, labours, with all the force it possesses, in the same work of alteration. Whatever of earthy, saline, metallic, or inflammable, the soil of the upland contains, is thus floated or rolled along to the low lands, and constitutes, with proportional diversity and mixture, the intermontane soil. The bars of arenaceous matter off Sandy-Hook, where the Hudson joins the Atlantic, and, at the disemboguement of most great rivers, are plain confirmations of this procedure; as are the shallows between the bays of Tappan and Haverstraw, and the Overslaghs, in the neighbourhood of Albany. The formation of deep and large gulleys on the side-hills of farms, the hardening of miry places, the filling up of ponds, the consolidation of sloughs and quagmires, are all of them confirmations of the reality and extent of these operations. Alluvial deposits of this nature will necessarily be as various as are the ingredients of soil which they wash. Accordingly, where clay, in large quantity, has been suspended in, and diffused through water, it has formed on its deposition vast strata, which underlay great tracts of level country. Thus, the flat, between the basaltic rocks and Stony-point, at Haverstraw, appears to be wholly underlaid by argillaceous strata, which, as their edges appear along the shore, are not yet hardened enough to withstand the impression of the walker's foot. Much of the level country between Red-Hook and Greenbush, is evidently bottomed on a stratum of clay. The tract between Albany and Sche-

nectady, has a stiff and thick layer of clay beneath. The same remark applies to the space, lying for some miles beyond the Mohawk River, toward the Ball-town Springs; and to the great collections of similar earthy matter, lying westward along the flat country, between the Upper Falls and Fort Stanwix. It would be easy to give other instances of extensive strata of argillaceous alluvia, but these appear to be sufficient.

When silicious sand is the prevailing matter which the floods bring down, then the soil will consist chiefly of this, as in all the instances just enumerated, where, since the argillaceous layers were deposited, a stratum of loose sand, of considerable thickness, has been strewed over their surface, and, in most places, completely covers it up.

Where clay and sand, instead of being deposited successively in separate layers, as in these instances, have subsided from their watry connection in mixture with each other, they form *loams* of different degrees of friability or stiffness, as the silicious or argillaceous ingredient happens to predominate. And this is by far the most common case that occurs; the mixture of clay and sand forming the rule; and the occurrence of them in their separate states being the exception.

If water issues from hills, consisting of calcareous earth, or abounding in lime-stone, it follows, from the known solubility of this substance in that menstruum, that a portion of it must, in such form, be conveyed to the country below. While, in addition to this, whatever portions of calcareous rock had been broken off, and reduced to a smaliness sufficient to be moved by the currents, will be dragged down their channels, and eventually reach the plains. In these ways, the calcareous earth seems to have been deposited in some moory and swampy bottoms, in quantity enough to constitute, with the other matters it meets with, marles of various kinds and goodness.

In several spots along the shores of the Hudson and the Mohawk, the ferruginous sand which may be collected in considerable quantities, affords evidence enough of the abrasion of iron from the places where its ore abounds. This metal, in the form of oxyd, or ochre, or sulphate, thus joins itself to the other materials of alluvial strata; or, in the form of chalybeate water, imparts to them its tincture and impregnation. Bog-ore, (Ferrum Tubal-Caine) has evidently been deposited, and accumulated, where it now abounds, by the operation of similar causes, rather than, as some ingenious persons have imagined, from the decomposition of organic matter.

Another agent, in forming these secondary accidental strata, is the expansion of water, as it consolidates to ice. The crystals, into which it shoots, on its congelation, are so arranged in

respect to each other, that they are incapable of being contained in a space as small as the water occupied. On the withdrawing of heat to a certain degree, there necessarily follows an assumption of this crystallized figure by the water; and, consequently, an enlargement of its volume. The force which ice is capable of exercising, when compressed or confined in such circumstances, exceeds all calculation. Nothing appears either too heavy for it to lift, or too strong for it to break. The time when it is particularly active in splitting rocks, and tearing down the structure of mountains, is when, after falls of snow, there succeeds a day warm enough to melt it, or rain in sufficient quantity to fill the chinks and fissures. Whenever the vacuities are thus penetrated by water, and a freezing night, or continuance of cold weather succeeds, the hardened water being under necessity to occupy more space than before, rends the masses of rocks asunder. If the strata between which it has insinuated itself are horizontal, it elevates the upper ones; if perpendicular, it crouds them apart: if on the side of a precipice, the unsupported portion, on the instant of its separation, rushes down with impetuosity, to find a resting place below. Occurrences of this kind are frequent in our mountains, and among the basaltic rocks in particular. The noise of the falling fragments is often heard to a considerable distance. Nor does the operation of frost confine itself to the dislodgment of rocks in large portions. Wherever water can penetrate the open texture of freestone, or find its way among the bibulous or porous particles of calcareous and argillaceous rocks, there, during the season when melting heats are rapidly followed by hardening colds, the solid masses become reduced to a powdery consistence, and their surface crumbles away in the form of gravel, grit, or sand. The vestiges of this process are so frequent in the mountains, that as the Commissioner saw rock detaching itself from rock, and particle receding from particle, these scenes of decay and ruin impressed him, in the strongest manner, of the revolution which, even in his own time, and before his own eyes, the world is undergoing.

In giving an account of the substances which enter into the composition of these recent strata, and the sources whence they are derived, the tincture which the mineral and vegetable matters composing them, receive from the addition of animal substances, must not be omitted.

These moist and level spaces now described, are exceedingly well adapted to be the dwelling-places of animals; plenty of vegetables for them to feed on, and of water to live in, make many of these spots teem with creeping things. The speedy death and renovation of many tribes of these living creatures, in numberless swarms and multitudes, however small the individual may be,

give an idea in the aggregate of a vast sum of animal matter. Myriads of these, viewless and unknown, after having ceased to perform the functions of life, go into the common mass of extraneous substances. When they are of the testaceous kinds, their calcareous coverings, mingling with the other materials of the soil, and crumbling, by degrees, to dust, constitute shell-marl, (Humus Conchaceus.) Where large quantities of animal substances have decayed in any spot so frequently, as that their relicks form the greater part of the upper stratum of earth, the product is animal-mould, (Humus Animalis.) If, in such situations, animals have died bemired, or in any other way, their ribs and thighs, discoverable by digging, several feet beneath the present level of the surface, as at the Wall-Kill, satisfy us of the reality of these accretions, but leave us oftentimes doubtful of the species of creature whose bones are under examination.

(To be continued.)

ARTICLE II.

An Account of the BILIOUS FEVER *and* DYSENTERY, *which prevailed in Sheffield, Massachusetts, in the year* 1796.

By WILLIAM BUEL, *Physician.*

IN a letter to Mr. Smith, published in Mr. Webster's Collection of papers on the subject of bilious fevers, I have given some account of the febrile disorders which prevailed in Sheffield, in the years 1793, 1794, and 1795.

In a country town, where the air is not rendered insalubrious by a great number of inhabitants being crouded into a small space, and where habits of indolence and luxury have not sown the seeds of disease, a sickness, affecting even so great a proportion of inhabitants as that which prevailed in those years, is a rare occurrence. But one so nearly universal, and attended with so great a mortality, as that which makes the subject of this communication, is perhaps unequalled in the annals of our country.

To describe the history of the sickness which prevailed in the year 1796, with as much correctness as the importance of the subject deserves, it would be requisite to premise a minute and circumstantial topographical description of that portion of country where it appeared; a correct account of the disorders which had been prevalent in the preceding years; and results of meteorological and other observations relative to the air and weather, accurately made for each of the preceding sickly years; materials for which I have to regret that I am not in possession of.

The necessity for these things becomes, however, in some measure removed, when we recollect that the principal cause of the sickness, which has so severely afflicted the people of a part of Sheffield, for several years past, admits of the most conclusive demonstration. There are few points in Medicine, more firmly established than that of the mischievous effects of marsh effluvia.

For an account of the sickness of the preceding years, I shall refer to my letter published in Mr. Webster's Collection, and shall attempt

A sketch of the situation of that part of Sheffield, which was the scene of sickness in 1796, *with a few remarks relative to the weather of that year.*

The part of the town in which the sickness prevailed, is almost a perfect level. The river Housatonak, whose width is generally between thirty and forty yards, runs through it in a ser-

pentine direction, and with a very gentle current. Its banks at low water, are from eight to fifteen feet high; the bottom, for the most part, is soft and muddy; and its depth such as to make it fordable in but a few places. On each side of this river, there is a considerable extent of luxuriant meadow ground, whose surface is generally overflowed when the snow melts in the spring, and sometimes by freshets, at other times in the year. This meadow ground is all much interspersed with coves or pools, which are left, after the subsiding of the flood, full of stagnant water. The water contained in these coves, which are, in fact, great reservoirs of animal and vegetable filth, is, in the course of the summer, evaporated from some to dryness, from others nearly so, and from all in a degree proportioned to the dryness of the summer.

Beside the meadows adjoining the river Housatonak, there are several other streams which run through large tracts of flat and very marshy land. On one of these streams towards the north part of the town, is the mill-pond which appeared to be the common center of the sickness in 1796, and the preceding sickly years. This pond overflows a large tract of land which was formerly covered with a luxuriant growth of timber, and other vegetable productions, and which are all now dead and in a state of dissolution, in consequence of the action of the water upon them.* Whenever a dry season occurs, the water recedes from almost the whole of the land last flowed, and leaves the whole mass of dead animal and vegetable substances lying on its surface, exposed to the action of a scorching sun.

From a view of this state of things, it is not unnatural or unphilosophical, to expect the commencement of a putrefactive process upon an immensely large scale. That this effect does in fact take place, is demonstrable, not only by our reasoning faculty, but by the testimony of our senses. The fætor which arises from the surface of this drowned land, when made bare by dry and hot weather, is extremely disagreeable and offensive to all who approach its borders. It is strongly perceptible to travellers who pass on the roads within its vicinity. The stench is smelled by the inhabitants, at times, even to the distance of half a mile. An exposure to the effects of this noxious effluvium, contiguous to its source, not unfrequently, in the year 1796, produced immediate nausea and vomiting. A man who spent a few days at the house

* It is important that it should be remarked in this place, that this pond, although it was originally raised about the time of the first settlement of the town, which is between sixty and seventy years ago, was, when the dam was rebuilt, about twelve years since, raised about seven feet perpendicular, by which means the water spread over a much greater extent, of surface, than it had done antecedently to that time. It is on the land last flowed, that the substances, to which I allude, exist.

of a relation of his residing near the pond, told me, that while traversing the banks of the pond in pursuit of game, he experienced a stench so excessively offensive, that it immediately produced nausea and vomiting, which he was not entirely free from, until he was attacked with bilious fever, at his own house, in a very healthy part of the town.

I will, as well as I am able from memory, make a few remarks, relative to the spring and summer of 1796, which, perhaps, may not be totally unconnected with the sickness of that year.

In the latter part of spring, when, in common years, we have mild and pleasant weather, suited to bring forward the productions of the earth, we this year had, almost uniformly, cold, cloudy, and rainy weather. The spring of course was very backward. We had such an excess of rain even through the month of June, that all our streams, ponds, coves, and marshes, were kept very full, and even our dryest land was highly surcharged with water. But from the beginning of July forward, we began to suffer from the other extreme: we very seldom had rain, and uniformly the weather was intensely hot, particularly in the month of August. In all the latter part of summer, and beginning of autumn, the earth was not refreshed by rain, nor the air by thunder and lightning. Indeed, the oldest person living does not, perhaps, remember a summer in which there was so little thunder and lightning. The drowth was so great, that vegetation was much injured; grazing grounds particularly were parched almost to perfect dryness. The springs and streams were so much dryed up, in many places, that it was with great difficulty that water could be procured for cattle.

In the month of September, we were almost every night enveloped in thickest fogs.* Such abundant evaporation of water rendered the nights and mornings, until the sun had dispersed the fogs, most intensely cold; while, at mid-day, we were scorched with an intolerably hot sun.

Mosquetoes, which are always remarkably thick about the stagnant waters of this town, were this year, it was remarked, much more numerous than usual.

About the 20th of September, when the sickness was at its height, the weather suddenly grew cold and serene, and continued

* It is not probable that the cause of the pestilence which we experienced invaded in the form of fog. The poison of marsh effluvia is, probably, too subtle for ocular detection. Fogs are, perhaps, no indication of the unhealthiness of a place: they as frequently proceed from pure and running water, as from that which is stagnant and corrupt. It is probable, however, that such alternation of the extremes of heat and cold, as the body is exposed to from great fogs, in hot weather, increases its susceptibility of being operated upon by the causes of disease.

such for two or three days. Great expectations were entertained, that an abatement of the sickness would be the consequence of this alteration; but no such abatement took place; people continued to be attacked as frequently as before, until about the end of the month.

How much, or how little, all of the circumstances which I have related, affected the succeeding sickness, I shall not in this place hazard an opinion. One inference, however, seems naturally to result from a consideration of them; the keeping up of the water to an unusual height, over a large extent of surface, covered with putrefying substances, and the then sudden withdrawing of the water, and the consequent exposure of them to the action of a hot sun, are circumstances extremely well adapted to produce and give activity to great quantities of that pestilential vapour, which is called marsh effluvia. In confirmation whereof, I shall attempt

A particular history of the sickness of 1796.

On the evening of the 6th of July, I was requested to visit two daughters, one about eight, the other about six years old, of a Mr. Fairchild, who lived about half a mile, in a south-eastern direction from the pond. I was informed that they had been taken the day before, with a looseness, which had increased to such a degree, that the parents thought it necessary that it should be restrained. I did not at first suspect the disorder to be dysentery. I had never before known an instance of that disease in the course of my practice in Shetfield, which had been several years; what I directed was, of course, not with a view to that disorder. The next day I was convinced that their complaint was a genuine dysentery. A day or two after the sickening of the children, Mrs. Fairchild was attacked with symptoms similar to theirs, but so slightly, that she was able to attend to her children for two or three days afterwards. The eldest child, who had been infirm, died in about four days from her attack. The mother and the other child recovered, but not till after they had suffered severely from the disorder. Of three or four persons who belonged to the family, none were in any manner affected with the disorder. Nor were any of the nurses or attendants on Mrs. Fairchild's family, or any others who had communication with them, attacked sufficiently early to render their infection ascribable to contagion from them.

About the 10th of the month, another child, at seventy or eighty rods distance from Mr. Fairchild's, and one at the distance of two miles, were taken with the dysentery. About the 17th or 18th, a girl, and soon afterwards several others in the family, at about three fourths of a mile distant from Mr. Fairchild's, and within a few

rods of the pond, were taken. By the 20th, there were a number of other scattering instances, within the sickly circle which I shall hereafter describe; and by the close of the month, there had been about twenty persons, the most of them children, attacked, and several had died.

About the 20th, three youths of one family, were taken at nearly the same time, with febrile symptoms, which, although disguised at first by some peculiarities, turned out to be bilious fever. From this time, instances of this fever frequently occurred, so that it was apparent both disorders were endemic, and becoming frequent. In a short time, both prevailed to a degree truly calamitous and alarming.

The following description, together with a statement of the number of deaths, will convey some idea of the distressed situation of the people who dwelt within the limits of this ravaging sickness. Let an imaginary circular line be described, from a point on the south-eastern side of the above-mentioned mill-pond, whose radii shall be one and one half mile in length. This circle will embrace about one hundred families, and about six hundred inhabitants. It would comprehend the whole territory, in which the sickness prevailed, with so much exactness, that there would be considerably short of ten families without its limits, in which there was sickness; there certainly were not ten within which were exempt. Of this number of inhabitants, at least half were, in the course of the season, affected with either bilious fever, or dysentery.* The eastern half of this imaginary circle was the most populous; it was also the most sickly. Out of about four hundred and fifty persons which it contained, at least two hundred and fifty were affected with sickness. Of the one hundred and fifty who dwelt nearest the pond, there were not ten who escaped. Of the remaining one hundred and fifty who inhabited the western semi-circle, there were about fifty affected.

To the people who dwelt within this small description of territory, this distressing sickness was most distinctly confined. They who before this time had been in the habit of knowing but a few deaths among them in the course of a year, now hardly knew a day to pass without witnessing the solemnity of a funeral, sometimes of two or three in a day. Many whole families were all

* The eastern part of this circle would extend across the Housatonak river, and would embrace about one hundred persons, who dwelt on the eastern side. It may become a question, admitting that marsh effluvia were the sole cause of the disorders in question, how far their sickness was ascribable to the stagnant water in and about the river, and to which they were contiguous, or to the distant and more productive source of the poison, the pond. However this may be, the proportion of sick was much less in this part of the circle, than in that about the pond.

down at a time, and some of them in the agonies of death; sometimes without being able to procure a single person to perform the office of nurse or attendant. Even after the closing scene had past, it was with difficulty that help could be obtained to perform the last sad offices of humanity.

During the prevalence of the bilious fever and dysentery this year, there were no less than forty-four persons, from the inhabitants of the above described circle, who fell a sacrifice to one of those disorders.* Of this number, twelve were adults, and thirty-two children. The children, all except two, had dysentery; the death of one of those two, whose disorder was originally bilious fever, was caused by an abscess; the other had convulsion fits. Among the fatal cases of adults, there was but one male. He was a man of between fifty and sixty years of age; and had both bilious fever and dysentery. He neglected to procure any medical aid, until he had been affected with the dysentery a week, and with bilious fever a fortnight. Even then, his first application was to a quack, whose nostrums, he had the candour to confess in his last moments, he believed injured him. After this period, his disorders resisted the usual remedies.

Three of the adult females were women in a state of preg-

* Since writing this account, I find two or three of the deaths were of children who belonged contiguous to a mill-pond, at the south part of the town, and who died of dysentery. There were a few other instances of dysentery this year, as there had been of bilious fever for several years past, at the same place.

In the letter to Mr. Smith (referred to in the beginning of this paper), it is remarked, that the Fever which prevailed in Sheffield, in 1794, was principally observable in the immediate vicinity of the *South Pond*, while that which prevailed in 1795, as is usually the case, was in the neighbourhood of the *North Pond;* and that, at that time, I was unable to learn the cause of this diversity in the theater of the disease, in those two years. This I have since discovered, and deem important enough to deserve to be recorded.

It appears, on investigation, that, in the year 1794, the waters of the *South Pond* were drawn off, for the purpose of repairing the dam, or the mills. This left a large extent of putrescible materials bare, and the progress of the season gradually produced those morbid exhalations which I suppose to be the cause of Fever.—Indeed, this fact sufficiently explains why, *cæteris paribus*, that part of the town should be more sickly in 1794 than in common years.

Again, I am persuaded, from my own observation and the uniform testimony of others, that the land flowed by the *South Pond*, is kept much more constantly and completely covered with water than that flowed by the *North Pond*. The importance of this distinction will be obvious to every mind; and will, probably, be thought to go far towards accounting for the difference of insalubrity in the atmosphere of the two ponds, in common years, and under ordinary circumstances.

nancy, and who died of bilious fever. Of the remaining eight, one was a very aged woman, two laboured under chronical disorders, by which they were greatly debilitated; they died of dysentery. Three of the remaining five died of dysentery complicated with fever, and two with bilious fever alone. Hence it will appear, that out of this whole number of mortal cases, there were but two from bilious fever alone.

Symptoms of bilious fever and dysentery, with some remarks on the prognostic in each disorder.

The symptoms of attack in bilious fever, differ very little, except in degree, from those in common ague and fever. The patient sometimes has pains and rigors running over him, for several hours, before he has a proper fit of ague; but generally a chilliness, which soon increases to a violent fit of cold and shaking, is one of the first symptoms. It is accompanied with hard pain in the head, back, and limbs, particularly in the back. The pulse in the cold fit, is low, quick, and hard. Towards the close of the cold fit, nausea, and not unusually a bilious vomiting, occur. The length of this fit is uncertain; it lasts from one to a number of hours. At length the rigors and shaking begin to subside, and the patient becomes sensible of great heat and thirst. The pulse becomes full, frequent, and hard, and sometimes rebounding. The face is flushed with redness; the eyes assume a red, watery, and inflamed appearance. This appearance of the eyes; is usually proportionate to the violence of attack, and the future force of the disorder.

The duration of the hot fit is extremely various, it lasts twelve, twenty, thirty-six, and sometimes forty-eight hours; that is, the fever, in some instances, particularly at the first attack, runs on for that length of time, without suffering any abatement that may be called an intermission, or even remission. It is true, nature, in the course of the time, will sometimes seem to make efforts to produce a termination of the paroxysm, by salutary sweating; a moisture will just begin to appear, but will be suddenly dissipated, and the fever will kindle up with renewed violence. When an effectual and salutary sweating does take place, it is commonly very profuse, and the more free and profuse, the more perfect is the relief obtained. The febrile symptoms now gradually abate, and subside either partially, so as to produce a remission, or, more perfectly, into an intermission.

The interval, too, which succeeds, is of uncertain duration. The great irregularity attending the duration of the different stages of the paroxysms, produce, in different cases, all the varieties of quotidian, tertian, double tertian, quartan, and even some which

it was difficult to reduce to either of the usual distinctions of intermittent fever. A regular tertian appeared to be the most mild and eligible form of the disorder, and that in which it was the most easily managable. When the fever was quotidian or double tertian, the intermission or remission was too short to afford an opportunity of doing much with the most important curative remedies. A regular quartan form was not frequent, although there were some instances of it.

The symptoms of disturbance in the alimentary canal, are a very important article in the description of this fever. I have mentioned before, that nausea and bilious vomiting were occurrences which frequently took place towards the end of the cold fit. Indeed, the presence of a preternatural secretion of bile is a never-failing concomitant, from the first attack of the disorder, to the termination of a lingering and tedious convalescence. Symptoms of flatulency are almost constantly attendant, particularly about the time of the approach of the sweating fit. Flatulence gives rise to great pain and distention of the stomach, belchings, and a sense of suffocation so intolerable as apparently to threaten an immediate extinction of respiration. The breaking forth of a freely flowing sweat commonly produces relief.

The appearance of the tongue in this disorder affords a very just indication of its degree of violence. In a mild degree of it the tongue is covered with a whitish fur, which is always moist. When the degree of disorder is somewhat more considerable, the tongue towards its point, especially at the height of the paroxysm, loses its moisture, and the dryness becomes extended as the degree of disorder is increased. In a still higher degree of violence, a black stripe appears, extending from the root to the extremity of the tongue. In the worst cases the tongue was covered all over with a very thick black fur, and remained at all times intensely dry and parched. In some of the very worst cases, it would be perfectly free from fur, and as dry as a husk. In the most violent case of this fever which I ever saw, although, from more strength and firmness of stamina, it terminated favourably, the tongue was from the beginning entirely free from fur. It all the while had a red and shining aspect, and was parched, or rather, as one would judge from its appearance, was roasted, with a husky dryness. The prognostic from a very black and dry tongue, was not that there was very great danger, but, on the contrary, that state of the disorder in which this symptom occurred, was almost certainly manageable by proper remedies. One of the first signs of amendment was the appearance of a moisture, and the "cherry-coloured redness of health," in a very narrow streak upon the edge of the tongue. This sign was hardly ever deceptive.

In a fever producing such general derangements of the system,

it was not to be expected, that the intellectual functions would escape unaffected. In almost all considerable cases, there was, at the height of the paroxysm, some degree of delirium, coma, or stupor. It was not uncommon for a stupid, comatose state to be constantly present for several days; sometimes to such a degree, that it was difficult or impossible to arouse the person. An imperfect state of the senses, particularly of the sense of hearing, sometimes took place, and continued, in some degree, through the convalescent stage of the disorder.

So remarkably protracted was the convalescent stage of this disease, that the symptoms thereof require some consideration. It has been supposed, that the frequency of relapse in this fever, and in common intermittent fever, is occasioned by some incidental extraneous causes, such as fatigue, errors in diet, exposure to cold, to night air, and the like: these circumstances undoubtedly may act as exciting causes to relapse; but I am convinced that the most rigid caution in these respects, will not alone secure persons who have had these disorders, from relapse. It is evident, that there is something in the nature of the contagion producing these fevers, which disposes it to operate on the human body, if I may so express myself, with an intermittent action. By intermittent, I do not mean to allude to the type of the fever, but the periods of the different attacks. The system, after it has become habituated to the contagion, and ceases to be operated upon by it for a time, at the end of a certain period loses that habit, and is again excited into morbid actions. That this tendency of the disorder is owing to its nature, and not to particular remedies made use of to cut it short, as has been supposed by some, is evident from the fact that it takes place, as well when the disorder is suffered to run its course, as when it has been shortened by remedies. This fact is ascertained by a very great number of instances of each kind, both in bilious fever, and common intermittent, which have come under my own observation, and to which, with a view to the establishment of this fact, I have given the most particular attention. As a confirmation of this idea of the disorder, I have found that the returns have always inclined to be periodical, and even when every precaution has been made use of, the relapses have returned at regular periods. And, however inexplicable, or even fanciful, the idea may appear to some, it is certain, that those periods are, in some way, affected by a lunar influence. In a great number of instances, repeated relapses have taken place, once in a fortnight, without varying in any instance more than one or two days, from the new, or full of the moon. In others, the intervals would be three weeks. But in all where I have observed, there has appeared a tendency to septenary periods. I have myself had four successive slight attacks of an intermittent, at almost exact intervals of

three weeks. I have known persons to be attacked regularly in periods of two and three weeks, with relapses of bilious fever, for three, six, and even twelve months, without interruption.

The commencement of winter appears to have some degree of effect in stopping the tendency to relapse; but its operation is not universal. So strong is the tendency of this contagion, to have a long continued operation upon the system, that it requires many months, and, in some instances, even years, to eradicate it. I know several gentlemen who contracted the disorder from the marshes in the western part of the State of New-York, more than two years since, who yet experience a continuation thereof in occasional febrile attacks.

The symptoms of attack in a relapse, are similar to those of the original disorder, but generally less violent; the intermissions are more perfect, and the disorder, in every respect, approaches nearer to the form and degree of common intermittent fever. A relapse generally terminates in the course of a few days of itself. A bilious vomiting and diarrhœa, seem sometimes to become a crisis to the attack. These symptoms, together with head-ach, appear sometimes to constitute the disorder, in relapse; fever being almost intirely absent. Indeed, it is peculiarly apparent, in the convalescent stage of the disorder, that the biliary secretion is eminently affected by the contagious cause. The face, and indeed the whole skin, is of a pale, yellow, and bilious hue. The urine, when evacuated, appears to be highly surcharged with bile. There are, at all times, evident indications of a preternatural quantity of this fluid in the stomach and intestines.

The usual precursor in DYSENTERY, was a griping pain in the lower part of the abdomen. This was, usually, soon followed by a continual tenesmus, and some small and painful discharges by stool. It was not common for those who were attacked with dysentery, to experience chills at the beginning of the disease, or to be immediately affected with much fever. Children, who frequently fell a sacrifice to the disorder in the course of three or four days, would, for several hours after they were attacked, continue to run about and make no great complaint; and adults would frequently continue about their business for several days after they had frequent dysenteric stools.

As both the diagnostic and prognostic in dysentery are chiefly to be obtained from the state of the stools, I shall endeavour to be very particular in my description of the various appearances which they exhibited.

The most common, and what might be called the natural dysenteric stool, was a small, whitish mucous discharge, mixed with streaks of fresh looking blood. In some cases, the blood was entirely wanting; this might be considered as a variety in the natural

form of the discharge. There was seldom any excrementitious matter mixed with these discharges, unless cathartic medicines had been employed; and they were nearly or quite free from any excrementitious smell; the smell of them was peculiar; but, in the beginning of the disorder, not very offensive. This state of the stools, when the disease terminated in health, generally continued from beginning to end. As it began to abate, the natural fæces appeared with the mucus, and the proportion of mucus became gradually less, until it disappeared, and the stools became natural. Among the deviations from what I consider the natural form of the dysenteric stool, was

A stool, in which the blood was diffused among the mucus, tinging the whole with a uniformly bloody appearance. This stool always indicated an unfavourable state of the disease. But when the stools were very liquid, and tinged with blood, resembling water, mixed with a small quantity of fresh blood, the indication was still more threatening. When the stools were of this last kind, I believe they were always involuntary, and that a fatal event ensued.

A stool, resembling beef brine, sometimes occurred; this briny stool was, in some cases, of a liquid, in others, of a mucous form; either kind was unfavourable, but not uniformly fatal.

I recollect the instance of a stool, in a child of five or six years of age, which was, in the beginning, pure mucus, free from any streaks of blood, and which gradually assumed a purulent appearance, until it looked like perfect pus. I supposed, in this case, that death was inevitable, but, to my surprise, the child recovered.

A greenness sometimes appeared in the mucus; it was indicative of an obstinate disorder; but when it appeared with the feculent matter, in the convalescent stage, the sign was not so unfavourable.

In the progress of the disease, an acceleration of pulse took place, and the patient was affected with considerable thirst. The tongue was covered with a moist white fur; and in the last stage of the disorder, it sometimes became dry and black.

The rapid emaciation of body, and exhaustion of strength, which take place in this disorder, are, perhaps, unequalled in any other. Many children sunk under it in the course of two, three, and four days; some who were able to walk about the house in the morning, would be dead at night.

The danger in the dysentery was proportioned to the frequency of the stools, and to the deviation of them from the natural dysenteric state.

The indications of approaching death, are a sinking or a total absence of the pulse in the wrist; a coldness of the extremities; insensibility to objects; a sinking in of the eyes; the eye-lids but partially closed, and the eyes so rolled up as to discover only the

whites of them; stools growing excessively fœtid, and becoming involuntary; a hiccoughing; tossing about in the bed; making now and then a forcible expiration resembling sighing: this last symptom is peculiar to children, and is an infallible indication of a fatal catastrophe. It was not uncommon in children, for convulsions to close the scene.

The circumstances here enumerated, many of them, perhaps, indicate nothing more than an extreme degree of debility; but they indicate a degree of debility, which, in this disorder, is seldom recovered from.

The dysentery frequently came on while the patient was affected with bilious fever. In this case, the type of the fever soon became obliterated, and the accompanying febrile symptoms were similar to those in original dysentery. The change of the fever into dysentery did not, however, secure the patient from the tendency to relapse so peculiar to that disorder. But the convalescence of those who had simple dysentery only, was generally short, and the recovery perfect.

Sometimes the fever came on upon the dysentery. The type of the fever was not, in this case, easily ascertained, until an abatement of the dysentery took place; when, as the dysenteric symptoms subsided, the fever would appear in its proper form. The two disorders appeared to be complicated, that is, they both seemed to exist at the same time, rather than to act in alternation. The fact is certain, that, in cases of accession of dysentery upon the fever, the latter disorder always shewed itself in its true form after the symptoms of the other had subsided.

Remarks on the cause of bilious fever and dysentery, and a consideration of the question, whether they were infectious?

That the stagnant waters in Sheffield, and the sickness which prevailed there in 1796, and the other late sickly years, stand in the relation of cause and effect, is, I think, a position which no person capable of reasoning, can withhold his assent to, after admitting, and candidly considering the facts which I have stated. I am sensible that new facts were not wanting to confirm a belief among physicians and philosophers, that marsh exhalations are a poison which most infallibly produces what are called bilious fevers. But, however astonishing it may appear, it is a fact, that many of the people who dwell in the vicinity of the stagnant waters of this town, and even those who have been the greatest sufferers in the several sickly years, disbelieve the local origin of their misfortunes, and strongly oppose all attempts to remove or lessen the force of their cause.

The history of facts, in our country, relative to dysentery, does

not seem to warrant the conclusion, that that disorder originates in all cases from the same cause with bilious fever. But the reverse of that conclusion seems probable, from the fact, that dysentery has frequently prevailed as an epidemic in places where bilious fever was never known, and under circumstances where we should never expect the latter disorder. Admitting the fact, that bilious fevers universally owe their origin to a local cause, that disorder can, of course, be only endemic, or confined to a particular place; whereas dysentery is many times most extensively epidemic.

But in the sickness which makes the subject of this communication, there is every reason to ascribe identity of cause to the two disorders. They were circumscribed in a very striking manner, by precisely the same limits; they both began, and ceased to prevail at the same time; neither disorder occurred (except in a few instances of both disorders about the pond at the south part of the town), at any considerable distance from the limits, but in persons who had previously resided within them. There were instances of both disorders, affecting persons in different parts of the country, who *had* resided within those limits; a stay of only one night in the central part of the sickly territory, in some instances, produced the disorders.

The facts which I have stated prove sufficiently, that neither of the disorders were propagated by specific contagion, at least, beyond certain boundaries; otherwise they must have extended, for there was no interruption of communication. I have remarked before, that I was myself convinced, that neither disease was propagated by specific contagion, even within those boundaries. In all the cases, which came under my observation, of sickness without the limits, and acquired by a residence within them, there was no instance of either complaint being communicated from the person affected. In several cases of persons who acquired their disorder here, and sickened at a distance, I find, from authentic information, that the fact is the same. I have, as an exception, to mention the information which I have received from Doctor Orton, of Woodbury, in the state of Connecticut. The Doctor relates, that a young man of this town, who, in the time of the sickness here, went to Woodbury, was, soon after his arrival there, taken down with dysentery, and in a few days died. That in about six days after his death, a person in a neighbouring house was taken with the same disorder; and that, soon afterwards, all the children, who remained in the vicinity, all the nurses, one excepted, and many others, sickened with it, and that nine persons in the whole fell a sacrifice to it. He further adds, that at the time the young man was taken sick, the town was free from any instance of dysentery, or any prevailing fever. From this statement it results, that the dysentery was, in Woodbury,

propagated by specific contagion, from one person to another, and that the contagion was extremely active. How can these facts be reconciled to those which I have related as taking place in Sheffield? I have remarked already, that I was convinced myself, that neither the bilious fever nor dysentery was propagated by specific contagion, even within the sickly territory. As there appears to be a clashing of facts in this case, I will particularize some of the circumstances upon which I founded my belief. The disorder, as I have repeatedly mentioned, was certainly circumscribed by exact limits; admitting it to be infectious, it could not have been for the want of communication that it was not extended, for the parts contiguous were on all sides populated and intercourse between the affected and well, was not attempted to be interrupted. At the commencement of the sickness, persons were attacked at about the same time, at so great a distance from each other, as to remove all suspicion of their taking the disorder one from another. There were many families where one person only had the dysentery, and all the rest escaped. Those who were the most exposed to the action of the effluvia arising from the sick and from their stools, escaped infection; while those who were free from any such exposure, were attacked: I was myself, many hours in the day, for more than eighty days in succession, in situations to have my nostrils assailed by effluvia from the worst of dysenteric stools, but I escaped the disorder. Other physicians, and several nurses, were almost equally exposed, and without effect. Had the dysentery been infectious, within certain limits in Sheffield, I should have supposed a predisposition acquired from some local cause, to be necessary to give the contagion action, and I should have considered the people of Woodbury under the operation of the same predisposition: this, considering the flatness of the land in Woodbury, and the peculiarities of the summer and autumn of 1796, would not be unphilosophical. But I will content myself with having stated the facts, and shall leave them unaccounted for.

Since I have had opportunities of observing the symptoms of dysentery, the subject of its proximate cause has arrested somewhat of my attention. At a time when new theories of diseases are almost daily presented to the world, I have met with no one of the proximate cause of dysentery, from which a solution of the phenomena of that disorder seems to result. Dr. Cullen's idea of a spasmodic constriction of the colon, seems better adapted to an explanation of colic than dysentery. A constriction, it is obvious, does take place, but is it not probable that this constriction is a symptom, and not the proximate cause of dysentery? Why is it not probable that the principle of contagion, whether derived from a person affected with the disorder, as it sometimes is, or from the air, as I suppose it was in the sickness under considera-

tion, acts as a stimulus upon the *intestina crassa*, producing an increased action of their excretories, or perhaps an inverted one of their absorbents? Is not this idea analogous to what takes place in small-pox, measles, lues, and many other diseases which seem to depend on the operation of contagion upon some appropriate part? As a confirmation of my idea, I observed that there was every appearance in those who had dysentery, that all the derangements which took place in the system, were the effects of this primary affection of the intestines. What are the chemical qualities of that principle, in a vitiated atmosphere, which constitutes contagion, or, the same thing, which produces these disorders, I leave to those philosophers to investigate, who, of late, appear to be cultivating this branch of science, with a zeal and success which promise great future benefit to medicine. But in the sickly season which I have been describing, I have abundant reason to believe that the principle, whatever it may be, which produced bilious fever and dysentery, was the same. In the dysentery, it operated upon the lower intestines; in bilious fever, upon the stomach, liver, and arterial system. The modern idea, that the affection of the liver in producing a preternatural secretion of bile is one of the effects of the contagion, and not the cause of the disorder, is most certainly well founded.

Cure of bilious fever and dysentery.

After much additional experience in the disorder, I find no reason to alter my opinion, which is published in Mr. Webster's Collection, respecting the cure of BILIOUS FEVER. It consists in the use of purges of calomel and jalap, in divided doses, in the beginning of the disorder, proportioned, in quantity and continuance, to the strength of the patient, the force of the disorder, and degree of deviation from an intermittent form. Venesection, once or more, in violent cases, or when there was any tendency to topical affection, was beneficial. I directed cooling, diluent, and acidulous drinks, until nature appeared to be making efforts to produce the sweating fit. When those efforts were apparent, the sweating was much accelerated, and the patient exceedingly relieved, by the use of small doses of an opiate, warm drinks, and warm applications to the feet. The symptoms of flatulency, which were at this time so painful and distressing, were by nothing so well removed, as opiates joined with some grateful aromatic oil, or distilled water.

When the intermission became distinct, and in urgent cases, where there was only a remission, I exhibited the bark, in all cases, unless opposed by the prejudices of my patients or their friends. I began the exhibition as soon as the sweating fit had subsided, and

continued it till the accesion of the next paroxysm. From two drachms to one and one half ounce was taken in an intermission, according to circumstances. A suspension of the paroxysms never failed to be the consequence, the patient having no more than one, two, or at most three afterwards.

That the bark will suspend the paroxysms in this fever, is certain. And, that a continued use of it, or, what perhaps is better, an occasional use of it, together with a proper attention to diet, the state of the stomach and bowels, a due degree of exercise, and the regulation of the passions, for a sufficient length of time, will also perfectly obviate the tendency to relapse, is likewise a fact of which I have not the least doubt. But the cases are extremely rare in which we can obtain a proper attention to either of the above requisites to the desired effect. It must be acknowledged, that, in most cases, the bark did but suspend the paroxysms. It becomes a question, then, whether, in mild cases, it be best to cut the disorder short, or suffer it to run its course. I say in mild cases, for where there is the least suspicion of a doubtful event, the propriety of using the bark cannot be questioned. The tendency to relapse is equally great when the fever ceases spontaneously, as when cut short by the bark. The advantages obtained by the use of it are, that, increased debility is prevented, an exemption of a number of days from fever, with its concomitants, is obtained, and the danger of an accession of threatening symptoms is obviated. I know of no reasons of equal weight that can be opposed to its use, even in mild cases. But in cases of danger, a remedy which will, almost with certainty, avert a fatal event, ought not, on any consideration, to be dispensed with. In cases of pregnancy, a circumstance rendering the disorder a very dangerous one, I believe an early exhibition of bark affords the greatest chance of relief, even when no more than a remission can be obtained.

The Dysentery, especially in children, it must be confessed, seemed to defy the powers of medicine. I shall make some remarks on the remedies which I experienced the use of.

Purges; an assiduous use of them in the early stage of the disorder, was of the first importance. A judicious use of them in adults, would generally ensure a favourable event. Those most eligible, were Glaubers' salts, manna, castor oil, senna, and calomel. Each of these answered the purpose in some cases very well; but I found, after a thorough purging, at first with Glaubers' salts and manna, or the like, that repeated doses of castor oil gave greater relief than any other purgative. An abatement of the gripings, tenesmus, and frequency of stools, took place almost instantaneously after its operation, and to so great a degree, that many of my patients, after they had experienced the effects of this medicine, would, from their own feelings, determine when a repe-

tition was required, and request of me to administer it to them. Rheubarb I found to be a less eligible purgative in this disorder, than those which I have mentioned: I therefore soon quitted the use of it.

Emetics, in general, did not appear to be of any particular use.

Ipecacuanha, either as an emetic, purgative, or specific, did not appear to possess any particular salutary powers in this disorder.

Ripe fruits, the few that could be obtained, and drinks made from them, were certainly innocent, and probably of some utility.

Mucilaginous drinks, from gum arabic, marsh mallows, comfrey, the bark of what is called the slippery elm, and the like, I universally directed, and I believe with some good effect.

Antimonials, in combination with opium, after the use of purgatives, were certainly beneficial, particularly in the advanced stages of the disorder. I used emetic tartar, and antimonial wine, without being able to determine which of them deserved the preference. Either of these medicines, in conjunction with some of the preparations of opium, to which was sometimes added camphire, would procure an abatement of the frequency of the stools, a relief from pain and tenesmus, and some sleep. Opium alone produced no such effects, and was sometimes manifestly injurious: it increased the obstacle to the evacuation of the fæces, and of course the griping and tenesmus, and aggravated the symptoms of fever. I had no great experience of the effects of cerated glass of antimony; from what I had, and from the results of experiments made by other physicians, I am inclined to doubt its having any specific virtues in dysentery.

Clysters of mild mucilaginous substances, produced some relief from pain; with the addition of laudanum, they were, in the advanced stage of the disorder, a very valuable remedy.

Bark was not useful in simple dysentery, or even when complicated with fever, so long as the dysenteric symptoms predominated. In the convalescent stage, when the disorder assumed the form of diarrhœa, or when symptoms of the fever were present, it sometimes did good.

I attempted the sweating process, recommended by Dr. Mosely for the cure of dysentery. But when the sick are almost half of the time necessitated to be out of bed, and over the stool, it is impossible to procure and continue a salutary sweating. I soon gave it up as impracticable.

The celebrated nostrum of salt and vinegar was tried, and found, in mild cases, to have a salutary effect; but that it is not an infallible cure for dysentery, was incontestably proved by numerous experiments.

Astringents, of various kinds, were tried in all stages of the disorder, but, perhaps, in no instance with any good effect.

A vast multitude of nostrums, of various kinds, were recommended by quacks, and officious advisers, and frequently with

the most pernicious effects. No disorder, perhaps, affords more abundant scope for the exercise of quackery, than the dysentery. Generally fatal, beyond all other disorders, to children, who are the most obnoxious to its ravages, physicians are diffident in their expectations of success. The people naturally distrust those who distrust their own powers, and fly to the quack, who makes them positive assurances of relief. The perturbation of mind, on such occasions, is such, as to disqualify people from reasoning and judging. The scene passes rapidly off, and they are no wiser for their melancholy experience.

Since writing a part of the above, another season has past, which it may not be improper to give some account of.

About the time of the coming on of the sickness in 1796, and the other late sickly years, the bilious fever made its appearance again this year. It began in some families who had, subsequent to the sickness last year, removed to situations contiguous to the pond. It continued to attack people, within the boundaries which circumscribed the last year's sickness, until about the first of October. Those who had removed into the sickly territory since the last year's sickness, and persons who then escaped, were chiefly attacked. The former appeared to be particularly obnoxious to the disease. Between twenty and thirty persons, who had removed to situations contiguous to the pond, all sickened with bilious fever, without a single exception.

The circumstances of the season this year were not such as we should judge well adapted to produce, and give activity to marsh exhalations. The mill-pond, and other reservoirs of stagnant water, were, during the early part of summer, kept pretty uniformly full; and although the water in them, towards the latter part of summer, was lowered, it was at no time very low. There were, however, striking evidences of a vitiated atmosphere. The latter, I was informed, by persons who resided near the pond, was perceptible at a considerable distance; and from the universality of its effects, we must suppose the influence of the poisonous principle to have been, in no small degree, powerful.

There has been no instance of the fatality of the disorder in this town this year. The symptoms have been, in general, less violent than they were last year; in other respects, perfectly similar. The fever yielded with greater facility to the bark, than it has done in former years.

Dysentery has not appeared in any instance.

I have been informed of two persons, not belonging to this town, who, after residing a few days in the sickly territory, sickened with bilous fever, and died at their usual places of residence, which were where that fever has never been known.

Sheffield, Dec. 1, 1797.

ARTICLE III.

MEDICAL ESSAYS.—No. II.

INTRODUCTION.

AS a principal part of the evidence contained in the following Essay has been already published by Mr. Webster, in his Letters to Dr. Currie, it may he thought to require some apology from me for its introduction in this place. A simple statement of facts will, probably, be deemed sufficient.—The information from Mr. Paiba was communicated to Mr. Webster and me at the same time. The series of Letters in which Mr. Webster was then engaged, and the importance of the facts thus obtained, induced him to lay them immediately before the public. The probability of the existence of still further proof struck us both; and the inquiry after it, was relinquished to me. In executing this duty, (for such, under all the circumstances, I consider it,) I trust that some additional light will appear to have been thrown on this subject; while more leisure, and repeated conversations with Mr. Paiba, have enabled me to state every particular of his evidence more minutely and correctly, than could be done from a single conversation—in which it was impossible that some points of lesser consequence should not escape attention.

In respect to Dr. Chisholm, if it should be thought that I have spoken too freely of his conduct, I have only to reply, that the terms I have used are such as his conduct appears to justify; and such as he cannot complain of, if the facts be really as I at present believe them to be. But I have no quarrel with this gentleman, and I shall be as ready to withdraw those censures that I have passed upon him, should he convince me that they are unmerited, as I have been free to advance them; and in a manner equally public. An honest man can require nothing more: and this is a duty which every man owes to himself, as much as to the subject of his reprehension. E. H. SMITH.

New-York, February, 1798.

On the ORIGIN *of the* PESTILENTIAL FEVER, *which prevailed in the island of Grenada, in the years* 1793 *and* 1794.

THE pestilential diseases which, within a few years, seem to have prevailed with uncommon mortality in many of the principal towns of the United States, have attracted universal atten-

tion, and conferred an unexpected, and perhaps undue importance on the question,—"Whether is the Yellow or Pestilential Fever, "as it has appeared in this country, since the year 1790, a disease "introduced or imported from abroad, or one generated among "ourselves by local causes?"

The advocates for the reality of importation, in every instance of the prevalence of the fever within the United States, maintain, that it is a disease of specific contagion, the product of other climates, and incapable of being generated in our own. In opposition to this sentiment, many publications have appeared, in Philadelphia, in New-York, and in various other places, till the public mind has become almost weary with the discussion. It is not intended to renew it at present. A single point, only, in the great subject, is meant to be elucidated. The present inquiry is limited to the examination of the evidence relative to a single instance of the prevalence of the Pestilential Fever.

The friends of the doctrine of foreign derivation, appear to have relied on no authority with more confidence than on that of Dr. Chisholm. It has become a sort of fashion among them to refer, with an air of triumph, to his testimony, as exhibited in his publication concerning a Pestilential Fever which prevailed in Grenada, in the years 1793 and 1794, especially in the former, and which he pretends to have been brought thither, in a ship called the Hankey, from the island of Bulama (or Boullam), on the coast of Africa. But although, were this writer's account of the origin of the disease to be admitted for truth, it would by no means decide the question as it relates to the United States, still, before such an admission is granted, it is obvious to inquire to what degree of credit it is entitled; whether Dr. Chisholm has carefully collected and displayed all the facts concerning the fever in question; and whether he may not, from inattention, or ignorance, or design, have materially mistated or withheld some important articles of information. If it can be proved, that his history of the Grenada fever is erroneous from either of these causes, the argument in favour of imported contagion will derive no assistance from what he has adduced. To shew that his account of the origin of that disease is erroneous and not to be depended on, is the design of this essay.

Towards the close of the year 1791, a number of gentlemen in England, associated for the purpose of forming a colonial establishment at Bulama.* The *general* objects of this colony were to

* Erroneously written *Boullam*, by Dr. Chisholm; who appears to have supposed, that Sierra Leone and Bulama were near each other; and the two settlements connected. Into this inaccuracy he was probably betrayed from the similarity between the names of Bulama and the shore opposite to Sierra Leone, which is called the *Boulom* or *Boullom* shore.

promote civilization and knowledge among the natives of Africa; to effect a substitution of the commerce in its commodities, for the disgraceful traffic in its inhabitants; and to dispose the people of that unhappy country to peace among themselves, and to husbandry and the useful arts. Its *particular* object was to raise cotton for the Manchester market. Some of the most respectable men in England engaged in this plan, either as simple purchasers, or proprietors and colonists; and after a general meeting of the subscribers had elected a governor and council, to manage the affairs of the colony, the governor and council appointed the following gentlemen as trustees for the association, to remain in England.

Paul Le Mesurier, M. P. Lord Mayor in 1794.
Sir John Riggs Miller, Bart.
Col. James Kirkpatrick.
David Scott, Esq. M. P.
Moses Ximenes, Esq.
George Hartwell, Esq.

The names of these gentlemen are inserted here, as evidence of the respectability of the persons engaged in the enterprize.

The subscribers, or members of this association, raised about £9000. sterling, which was devoted to the purchase of conveniencies for the colony; for obtaining the territory, meant to be occupied, of the natives; and for the purposes of trade among them. The intended colonists, to the number of 275, men, women, and children, exclusive of the crews of the ships, were to be transported in three vessels; two of them (the Calypso and the Hankey, of about 300 tons each) chartered for the purpose; the other a copper-bottomed sloop of 34 tons, belonging to the association.

The island of Bulama lies at the bottom of a deep bay, about fifty miles from the open sea, and opposite to where Rio Grande, a principal river of Africa, empties itself. The center of the island is computed be in eleven degrees north latitude, and fifteen degrees west longitude from London: the place where the settlement was ultimately fixed, is about eleven and a half degrees north latitude. The circumference of Bulama is estimated at 120 miles, extending from east to west. The land rises gradually from the shore to the middle of the island, which is well-wooded, abundant in fine springs of water, full of game and wild animals of various kinds, and of a very fertile soil; being totally, as far as yet investigated, exempt from marshes and stagnant waters, and from stony ground. The tide is regular, and the spring-tides rise about 16 feet. The range of the thermometer, by daily observations, at noon, for ten months, is from 74° to 96° of Fahrenheit; and the medium heat 85°. The rains commence late in May, or early in June, and

continue till some time in October or November. On the whole, the situation is one of the most pleasant and healthy on the coast of Africa; though, like other tropical climates, not perfectly adapted to the constitution of natives of northern latitudes. Surrounding Bulama, but more particularly between it and the open sea, lie numerous islands of various magnitude, some larger, but the greater part not so large, forming an extensive Archipelago, to which the Bulama colonists gave the fanciful name of the *Hesperides*. At this time Bulama was uninhabited, but was the property of the Canabacs, a powerful, warlike and ferocious nation, residing on a neighbouring island.

Soon after the vessels put to sea, they were separated by a storm; and the Calypso, after touching at Teneriffe and Goree, arrived at Bulama, about the end of May, 1792, and near a fortnight before the Hankey. The whole of the people were in health when they sailed. The Calypso lost a man and two children on the voyage.

On the arrival of the Calypso, the governor landed some of the people; and while he was absent, with a small party, to explore the island, the Canabacs, mistaking the design of the colonists, surprized those who were left behind; killed and wounded a number; and carried off others as prisoners. This unfortunate occurrence alarmed the others so much, that the governor deemed it prudent to sail back to the island of Bissao (one of the Archipelago), where there is a Portuguese settlement. Here he found the Hankey and the sloop, who had arrived after touching at Teneriffe and St. Jago. While at Bissao, they conciliated the Canabacs; recovered those who had been made prisoners; and from thence returned in company to Bulama, which they soon after purchased, together with the adjacent island of Arcas.

The hurry with which the colonists had quitted England, some delays created by the government at home, in their departure, and their number, which exceeded what was at first expected, prevented their carrying out with them many conveniencies essential to the commencement of an establishment like the one proposed, and retarded their arrival till near the beginning of the rainy season. Some of the Calypso's people had already fallen sick when the Hankey arrived; and as there were no accommodations provided on shore, both sick and well were confined to the ships. The rains now setting in, obliged them to frame a sort of covering to protect them from the weather. In this confined situation, the heat and moisture were very uncomfortable; a due degree of cleanliness could not be preserved; and the disappointment and chagrin of most, with unusual labour, soon introduced sickness. In the Calypso, where the people were most crowded, it was now most prevalent; it soon affected the colonists on board the Hankey; but

it was not till a long time after, that any person sickened that belonged to the sloop, which was actively employed, and contained none of the intended colonists, but its own crew, or such as were occasionally on board to perform some service for the association. At length, the discontents of the colonists rose to such a height, that the greater half of them resolved to relinquish their design and return to England. Some few of them remained for a time at Bissao, but the principal part set sail in the Calypso.

The Calypso left Bulama about the 23d of July, for Sierra Leone; where the people were in hopes of finding accommodations till the cessation of the rains. Their passage was uncommonly tedious and tempestuous; many sickened on the way; and two or three died. When they arrived at Sierra Leone, they were disappointed of the expected accommodations on shore; and being more crowded now than at Bulama, in a warmer latitude, the season further advanced, with additional disappointments, and wholly destitute of occupation to divert their thoughts from their pressing difficulties, it is not surprising that the sickness on board the Calypso increased, and that a greater number perished here than had died out of both ships, previous to her departure from Bulama.

Concerning the sickness which carried off the colonists, both at Bulama, at Sierra Leone, and on the home passage of the Calypso, it may be remarked once for all, that it was by no means of one kind, as the readers of Dr. Chisholm would be led to suppose. Few, if any, escaped altogether. Some had regular intermittent fever, (which is the fever of the coast,) of various continuance, from a few weeks to several months: others had a violent fever, which terminated favourably or fatally in one, two, three, four, five, or six days; or which lingered out, after its first violence, as many weeks: some had diarrhœa and dysentery; and others fell martyrs to the indiscreet use of spirits and opium, as preventatives: and all these varieties happened on board the same ships, without any obvious difference in the exposure of the individuals to the causes of disease. Yellowness of the skin was a common appearance in the sick; and some of those who died at Sierra Leone had black-vomit; and this symptom also appeared at Bulama in the latter part of the season.*

The Calypso left behind, at Bulama, with the Hankey and the sloop, eighty-seven persons, viz. forty-nine men, thirteen women, and twenty-five children, well supplied with provisions. But be-

* Mr. Paiba informs me, that a girl recovered who had been very ill on their passage to Sierra Leone. She had been speechless several days, and for three or four days apparently dead, after having had the black-vomit.—This I believe was the first time that this symptom occurred among the Bulama adventurers.

fore any further account is given of the fate of this remnant of the original colony, it is to be observed, that the Calypso, the ship on board of which the sickness commenced and was most severe, both at Bulama and at Sierra Leone, arrived at London on the 14th of November, 1792, with between eighty and ninety colonists; that she lost thirteen people between Sierra Leone and London; that five others died out of her after she arrived at her moorings in the Thames; and yet, that no disease was ever propagated, or reported to be propagated by her, in London; nor do there appear to have been any obstacles opposed to her entrance, or to the landing of the people that came in her, or of the quantities of goods that they brought back with them—though this ship had only been subjected to a partial, and by no means to a thorough, cleansing, previous to her leaving Sierra Leone.

After the departure of the Calypso, the remaining colonists applied themselves with great assiduity, together with such of the natives as they could hire, to the preparation of accommodations for themselves on shore. The difficulties they had to encounter were numerous, considerable, and discouraging. Many of them were unaccustomed to labour; the sickness still continued; they were obliged to keep up a constant watch, for fear of their ferocious neighbours, the Canabacs; and they worked in the rains and heat. During the whole of the rains they had no breezes; so that the weather was close, sultry, and very oppressive. They succeeded, however, in constructing a considerable block-house, within which lodgings were prepared for such of the people as resolved to continue permanently at Bulama. But no particular difference was observable between the condition of those who lived on shore, and those who remained in the Hankey. Some of the people in both situations were sick; with no variations in the nature of their complaints, ascribable to the circumstance of being out of, or in, the vessel.

The official return of the acting governor of the colony, from the sailing of the Calypso till the 22d of November, when the Hankey left Bulama, is as follows:

		Men.	*Women.*	*Child.*
Left behind when the Calypso sailed	87	49	13	25
Returned from Sierra Leone	6	2	3	1*
	93			

* In this account of those who returned from Sierra Leone, Mr. Paiba informs me that there is a small mistake. He makes the number to have been eight, viz. five men, one woman, one infant, one servant boy. The difference is not material, as the rest of the return is accurate.

Of these there died 26 of fever,	12	5	9
1 of fever and flux,	1		
2 of consumption,	1	1	
1 of lunacy,*	1		
1 mortified hand,	1		
1 drowned,	1		
1 worms,	1		
2 complication of disord.	2		
1 hooping-cough,			1
4 disease not specified,	3		1
40	23	6	11

From the preceding list of deaths and diseases it is apparent, that though the mortality was very great, it was not wholly occasioned by fever. It may be added, that under the title *fever* are included those who died of it under *every* form; and whether they were hurried into their graves after a sickness of two or three days, or gradually sunk into them from the oppressive debility induced by an intermittent of several months continuance.

The time for which the Hankey had been chartered having expired, Captain Coxe prepared to sail for England; and with him several of the colonists—among others Mr. Paiba (one of the council) and his lady; making, in the whole, nineteen or twenty persons; all of whom, excepting Mr. and Mrs. Paiba, and a woman, were unwell. But before the Hankey put to sea, all the bedding of the sick was thrown overboard or destroyed; the ship was washed from stem to stern, both above and below, with salt-water, and then with vinegar and water; and the purification was completed by thoroughly fumigating her with tar, pitch, and gunpowder. In this clean condition they bade farewell to Bulama on the 22d of November, 1792; but in attempting to pass through the channel near to the entrance into the open sea, in a dark and foggy night, they got aground on a sand-bank, upon the north side of the island of Formosa, or Warang, belonging to the Bijugas, who are represented as Cannibals. The extreme terror excited by this accident, was not calculated to improve the health of the people on board the Hankey; so that, when it became necessary to take measures for their security and deliverance, only four men were found in a condition to do duty, and all of these had intermittents.

* By *lunacy* here is not to be underſtood *mania*. It ſeveral times happened that perſons who had been violently attacked with fever, were left by it in a ſtate of derangement more like *idiocy* than madneſs. In this wretched condition they frequently lingered ſome months, and then died. This the governor has denominated lunacy. Mr. Paiba believes that the four perſons whoſe diſeaſe is not ſpecified, muſt have periſhed in this miſerable condition.

With them, however, and his lady, Mr. Paiba sat off in an open boat, for Bissao, to obtain assistance from the Portuguese settlement. Thither he arrived, rowing through rains and fogs, in a leaky boat, after being out two nights and a day; and having attained such help as he could, returned to the Hankey, got her off, and carried her back to Bissao. On the passage there, eight persons died of those that belonged to this ship. At Bissao they refitted; and the Hankey *was a second time purified as completely as she had been before leaving Bulama.*

At length, all things being ready, the Hankey left Bissao, and by fortunate pilotage passed through the channel without accident, cleared Cape Roxo, and stood off to sea. There were then on board, Capt. Coxe, his two mates, boatswain, two seamen, and the cabin-boy, *crew*; and Mr. and Mrs. Paiba, a servant boy of theirs, a woman, and a little girl, *passengers;* in all twelve persons. The little girl died when they were at St. Jago; but, at this time, none of them were sick, but with debility and slight intermittents. A circumstance which marks the time of their sailing is, that they observed the festival of Christmas on this voyage, which was only of five days.

The Hankey arrived at St. Jago on the 30th or 31st of December; but, in attempting to enter, unfortunately got among the rocks in the Bay of St. Francis; from which she was cleared, after some days, by the assistance of two boat-loads of Americans, and thirty or forty of the natives, and brought into Port Praya. At this place the Hankey continued about two months. During this stay, all the people recovered their health, except the child who died, and Capt. Coxe, whose fever being irregular, and irregularly treated, he was sometimes well for several days together, and then had a relapse of about the same duration. Bark and the usual auxiliaries never failed to arrest the progress of his fever and ague; but, as is commonly observed, indulgences in free living, or in exertions of business or pleasure, caused it to recur.

From the moment of the arrival of the Hankey, till her departure, no other person that belonged to her was unwell with any ailment of consequence; her crew and passengers mixed without suspicion, and with perfect freedom, with the inhabitants of Port Praya; and received them on board, where they had a number of entertainments, of which the governor of the island and several of the principal people partook: nor was there ever any sickness occasioned by all this long intercourse, or suspected of being excited by it. Indeed, no sickness prevailed at St. Jago, during the Hankey's stay, except the common ague and fever of the place. And, certainly, it must be thought very extraordinary, that a ship which retained such deadly infection as to poison the whole town of St. George in Grenada, several months after leaving Bulama,

should not only not have affected a single person at St. Jago, during two months continuance there, and when a daily intercourse was kept up between her and the town of Port Praya, but should have been equally harmless to two boat-loads of Americans, fresh from a northern climate—especially as, were Dr. Chisholm's account to be received as truth, the contagion must be believed so active as to have destroyed the first person who came on board after her arrival at Grenada, and so diffusive as to extend, from vessel to vessel, through the whole harbour.

When the Hankey had been about a month at St. Jago, Commodore Dod arrived there in the Charon, a 44 gun ship. He had been directed by his government to afford such assistance to the infant colony at Bulama, as was consistent with the national service. In consequence, he had previously dispatched the Scorpion sloop of war, which was under his command, to visit Bulama, and return to him at St. Jago, by a particular time. The Scorpion proceeded accordingly, and the colony was mustered by Capt. Ferris, the commander, on the 11th of January, 1793.

Mr. Paiba was not at Port Praya, when the Charon arrived, but in the country. But he immediately repaired to town, and paid his respects to the Commodore, to whom he unfolded his situation, and that of the people who were with him, and requested such assistance as the Commodore could afford them. It was soon discovered that the Hankey would not be able to obtain such an addition to her crew, as would render it prudent to attempt to navigate her back to England; and notwithstanding Capt. Coxe's desire to undertake the voyage, (as his people were all well when the Charon left St. Jago,) the Commodore expressly directed him to make the best of his way to the West-Indies. The Scorpion not arriving at St. Jago by the time expected, the Charon, after a stay there of a fortnight or three weeks, and after sparing two seamen to the Hankey, departed for the coast of Africa; leaving an order for the Captain of the Scorpion to furnish her with two additional sailors. A few days after, the Scorpion came to Port Praya; and having reluctantly complied with the order, sailed again, soon joined the Charon, and they visited the several settlements on the coast in company.

As much stress is laid by Dr. Chisholm, on the intercourse between the Charon and the Hankey, it is proper to state particularly, what it amounted to.

As the people of the Hankey, and particularly Capt. Coxe, had not perfectly recovered their health when the Charon arrived, the surgeons of that ship were allowed to visit the Hankey, and to direct what was proper for them. But neither of these gentlemen were unwell in consequence. Commodore Dod being a strict disciplinarian, and beside exceedingly fearful of contagion,

never permitted his people to go on board the Hankey, except that in one instance, he suffered two of his men to assist in some repairs on her rigging. But before this, and indeed previous to any communication with that vessel, he had sent on board of her a quantity of powder; and the *purifications of Bulama and Bissao had been repeated.*

The barge of the Charon, by the Commodore's strict orders, had no other connection with the Hankey than simply this;—It was his custom to send it every morning to the Hankey, for Mr. and Mrs. Paiba, who usually spent the day with him, and returned at evening. When the barge came along side of the Hankey, it was kept waiting till Mr. and Mrs. Paiba were ready; when they entered it, and were immediately carried on board the Charon. At evening, they returned to the Hankey; and as soon as they left the barge, the people went back as before. So that the barge-men never were in the Hankey; and excepting the surgeons, the two mariners who were a short time (part of one day) employed about the rigging, Mr. and Mrs. Paiba, and Captain Coxe, who was three or four times in the Charon; no other people, belonging to either ship, had intercourse or communication with the other; and the connection with the Scorpion was still less, and of less duration. Nor was there ever any sickness on board either the Charon or the Scorpion, during their stay at St. Jago; and if any broke out afterwards, it was in all probability generated in those vessels, during their continuance on the African coast, by the same causes which occasioned it in the Calypso and the Hankey, and which so generally give birth to it in ships which leave cold for hot climates: for it is incredible, if any disease were communicable by the Hankey, that she should not rather communicate it at first, than after her long stay, and to the Charon before her purification, than just as the latter was ready to sail, so that it did not appear till after she had reached the coast of Africa. All these circumstances, therefore, being viewed in connection, there is every reason to believe that Commodore Dod was mistaken, in attributing the disease of which his men died, to contagion received from the Hankey; and that he consulted, in this instance, rather his fears and his prejudices, than his reason and the facts before him.

The latter end of February, or beginning of March, the Hankey left St. Jago, and proceeded for the West-Indies. Her crew and passengers were the same as before, with the addition of two mariners from the Charon and two from the Scorpion—one of which last was unwell when he came on board the Hankey, but able, at that time, to do duty. He grew more and more unwell as they proceeded, and actually died when they had been ten or twelve days at sea. Capt. Coxe, who was still unwell when the

Hankey left St. Jago, recovered his health before they reached the West-Indies, (though he afterwards had a return of his disorder,) and all the others were perfectly well, (notwithstanding the hard duty they had to perform,) and continued so.

After a passage of nineteen days, the Hankey arrived at Barbadoes, where she remained three or four days. While there, the people of the place came freely on board, and those of the ship all went on shore, and mingled as usual, with the inhabitants; but no disease was communicated, nor did any prevail at Barbadoes that year, like that which appeared at Grenada.*

From Barbadoes, the Hankey proceeded to St. Vincent's, where she made a stay of a day and a half, and where the same free intercourse took place between the people of the ship and of the island, that has been noticed in respect to the other. But no pretence ever was set up, that a contagious disease, or any disease, was communicated to the inhabitants in consequence; nor did the sickness which appeared at St. Vincent's the same year, commence till some time after that of Grenada had become general. It was then conjectured, that the Grenada fever had been imported into St. Vincent's; though, more probably, both arose from local causes, which might be more active at one place than at the other.

From St. Vincent's, the Hankey sailed to Grenada; where she arrived late in the month, or not till after the 19th of March: a month after the time fixed on by Dr. Chisholm. She entered, as he says, into the Bay of St. George's; but was soon after carried round into the Carecnage. The distressed condition of which Dr. Chisholm speaks in his account, arose solely from the want of sufficient hands to navigate the ship, and the consequent fatigue of those on board; for, at this time, all, even Capt. Coxe himself, were able to do duty, and were in health.

Immediately on his arrival (in consequence of a recommendatory letter from Commodore Dod), Mr. and Mrs. Paiba were invited about 14 miles into the country, to the plantation of an English gentleman, at whose house they resided during their continuance in the island of Grenada. A circumstance which may be considered as sufficient evidence, that Commodore Dod had no apprehensions of the liability of any person to contract disease from the people of the Hankey, at the time of his departure from St. Jago. As a confirmation of the truth of this supposed opinion of the Commodore, it may be observed, that Mr. Paiba went several times on board of the Hankey, mixed unrestrainedly with the

* One man belonging to the Hankey even remained behind, and resided at Barbadoes for some time—without occasioning any pestilence. His name is Curwood; I am informed he now lives at Albany, and will corroborate all the material parts of Mr. Paiba's statement.

towns-people, was at Dr. Chisholm's house, at the houses of most of the reputable merchants in St. George's, and yet, neither himself, his family, the friends with whom he resided, nor the families with whom he principally associated, ever had the disease: a fact very extraordinary, were Dr. Chisholm's notions of the virulence and extreme activity of the contagion supposed to be introduced by the Hankey, well-founded.

Still further to remove all suspicion respecting this ship, it is proper to remark, that she had no cargo on board, nor any thing but her few stores, and some goods belonging to Mr. Paiba. These goods were landed at St. George's, and stored at the house of a gentleman of that place, a friend of Mr. Paiba's, (a Mr. Napier*), where they continued unmolested; and no member of Mr. Napier's family suffered from the fever. The Hankey, in fact, was in ballast; which consisted of *green wood*, put on board at Bulama or Bissao; and which, being *dry* when she arrived at Grenada, and of course no longer useful for the original purpose, was thrown out there, and sold for firing. From such a lading as this, the most inveterate disciple of Dr. Chisholm will hardly expect to extract "contagion, pestilence, and death."

From a comparison of the preceding narration, with the history delivered by Dr. Chisholm concerning the Hankey, the reader will probably find ample room for doubt, as to the remaining statements of that much-quoted author. The facts and reasonings which are to follow, will perhaps succeed in removing any uncertainty which may yet remain. To this end, the reader is supposed to bear in mind, the several parts of Dr. Chisholm's publication, as he proceeds with the writer in the present investigation.—It is necessary, in the first place, to exhibit a correct statement of facts relative to Capt. Remington.

The Hankey had been at Grenada at least a month, and the sickness was universally known to be in the town of St. George, when Capt. Remington visited that ship. Luckily, Mr. Paiba was then on board, and remembers all the circumstances. These are his words.

"He (Capt. Remington) had been all day and night coming "from Grenville Bay, and had been wet through. He slept on "board in his clothes; and went in an open boat, *the next day*, "back to his ship: enough to kill any one in that climate."†

* Mr. Napier's house is on the Bay-side of the town of St. George.

† Manuscript communicated to me by Mr. Paiba, and now in my possession. Mr. Paiba being the principal part of the time on shore, is not able positively to contradict the assertions of Dr. Chisholm, concerning the crew of the Defiance—but from the foregoing narration; from what is proved respecting the case of Capt. Remington; and from what will be mentioned hereafter of Dr. Chisholm's conversation with Mr. Paiba; I have no hesitation to disbelieve the whole.

A mistatement of this fact, so surprizingly gross and enormous as that of Dr. Chisholm, unavoidably inspires something more than doubt concerning his whole narration. In this situation, it is proper, as far as may be possible at this distance of time and place, to institute an inquiry into all the circumstances of the memorable disease that prevailed in Grenada in the year 1793.

1. The town of St. George, in the island of Grenada, where the pestilential disease raged in 1793, is situated on a narrow strip of land, bounded on one side by the Bay of the same name, and on the other by the Careenage.

The Careenage is a long inlet or arm of the sea, running up on the south and east side of the town of St. George. It is low; little moved by winds; and nearly stagnant—as the tide never rises or falls there more than four, five, or six inches.

The shore of the Careenage, on the town side, is remarkably low, narrow, filthy, and crowded by numerous little buildings, chiefly of wood, which are separated only by lanes, situated on or near the wharves, and inhabited by the lowest of the people, ill-accommodated, and devoted to intoxication and every species of debauchery.

At the head or east end of the Careenage, is a large *marsh;* which, at all times, but especially at low water, sends forth the most noisome and offensive smells.

Into this inlet, vessels are generally brought to refit and careen, and indeed for protection, as they are perfectly safe from the winds. At the time of the Hankey's arrival, it appears to have been unusually crowded with shipping; and that ship was brought round from the Bay, into the Careenage, very soon after she reached Grenada.

2. This being the place where the sickness first shewed itself, and whence it extended to the neighbouring parts of the town, it may be proper, in the next place, to examine whether there was any thing remarkable in the seasons of the year, which should render the Careenage more than commonly liable to disease. The reasons which the preceding part of this essay afford for not acquiescing in the narrative of Dr. Chisholm, make it equally improper to receive his opinions on this subject without further inquiry: especially as the result of such inquiry seems to confirm a contrary position, and authorize a conclusion, that the weather of 1793 was favourable to the generation and spread of pestilential diseases in the vicinity of the Careenage.

The month of February 1793, was generally rainy; which, Dr. Chisholm remarks, "is an uncommon circumstance." March and April were mild, and more than half of May, "dry and dusty." During all this time, the wind was easterly and southerly, i. e. was from the very points to blow over the *marsh*, at the

head of the Careenage, into that part of the town which lies directly upon that inlet, and on to the shipping there at anchor. June, again, was very rainy: scarcely a day passed without rain: wind still from the south-east. The first part of July was *dry;* the latter part *wet*, and the atmosphere foggy and loaded with vapour. August was *dry*—" the atmosphere generally excessively " close, sultry, and loaded with vapour. The winds were very " variable; but for the most part a calm." The four following months remarkably rainy and tempestuous.

Whoever will take the pains to compare the weather of 1793, with that of three other years, as reported by Dr. Chisholm, cannot but be struck with their dissimilarity with that year, in this particular. It is a fact universally admitted, that constant *wet*, or constant *dry* weather, are both unfavourable to the generation and spread of pestilential fevers. It matters very little, in respect of the health of those who live in its vicinity, whether a *marsh* be completely drained, or constantly overflowed. It is from its humid surface, exposed to the action of heat and air, that pestilence arises. Now it will be observed, in Dr. Chisholm's Diary, that, in the year 1784, February and March were dry; and April, May, June, July, August, September, and October, were very rainy. In 1785, February, part of March, and all April, were dry; May, June, and July, rainy. August was chiefly dry; but September was wonderfully rainy and tempestuous—so that it probably destroyed any beginning epidemic, as the weather continued rainy all the fall. In 1786, February, March, April, May, and part of June, were mostly *dry* and pleasant. The remainder of June, July, and August, were *rainy;* September, and the first week in October, remarkably *dry;* but the rest of the season as remarkably *wet* and tempestuous.

From this comparative view of the weather, at Grenada, in different years, it appears, that whereas the seasons in general are singularly marked by long continuance of very wet, or very dry weather, in the year 1793, after the preparation of a dry spring, they were distinguished by alternate rains and dry weather—a succession the most favourable to prepare and bring into action the morbid miasmata of the neighbourhood of St. George: and to this, in conjunction with other causes, enumerated in the course of this Essay, may be ascribed the peculiar severity of the Yellow or Pestilential Fever of 1793. Even Dr. Chisholm himself acknowledges (p. 103) that " it had been urged by some, that the disease arose " from the state of the atmosphere; and that human contagion " could not give rise to it, as it was so prevalent in distant and " distinct places at the same time."—It belongs to another part of this paper to assign the probable motives of Dr. Chisholm for maintaining that the fever was imported into Grenada: certain it

is that he avowed a different opinion to Mr. Paiba, to whom he freely declared that he could by no means trace the disease to the *Hankey;* and that he believed it to be of local origin,—owing to the unhealthy condition of the Careenage, and to the particular prevailing winds: and, to confirm this notion, he informed Mr. Paiba that a similar disease, from the same cause, though in a less degree, had existed in St. George's, some years before.

3. If the situation of the Careenage, and the weather of the year 1793, appear to countenance a different opinion than that of Dr. Chisholm, as to the origin of the Pestilential Fever of Grenada, a no less formidable argument may be deduced from his own representations concerning the time of its first appearance in that year. For in p. 91. the Dr. remarks, that "in the short space of "time from the beginning of March to the end of May, 200 of "about 500 sailors, who manned the ships in the regular trade, "died of this fever." By this it appears that the Fever in question broke out as early as the beginning of March. The disingenuousness of this author is particularly evident from this quotation, if the period of the commencement of the disease be correctly assigned. And that it is so, is probable from the difficulty of concealing the fact; as there must have been thousands of witnesses to the progress of the Fever. When, therefore, it was thought proper to fix the odium of introducing the disease upon the Hankey (a project of which Dr. Chisholm seems originally to have had no idea), it became necessary for him to assign an earlier date to her arrival. Now, that the Hankey did actually not arrive till towards the latter end of March, is verified by the concurring testimony of Mr. and Mrs. Paiba, and of Mr. Bell of this city, who happened to be in Grenada about that time, and was personally acquainted with Mr. and Mrs. Paiba in that island. So that, if the disease commenced as early as the first of March, Dr. Chisholm has inadvertently disproved his whole account of its origin; and it is clear that the Hankey (which did not arrive till after the 19th of March, instead of February) could not have introduced it.

Another inadvertence of Dr. Chisholm, relative to this point, is, that though he speaks of Captain Remington as having been the first of all who were seized with the fever, which was next communicated to the crew of the Defiance, &c. yet he afterwards (p. 223.) details a case, which he declares "is inserted chiefly "from the circumstance of its being the *first* which occurred." But this is neither the case of Captain Remington, nor of one of the crew of the Defiance; and if, by the word *first*, it be supposed that Dr. Chisholm means the first that occurred in his practice, the evidence may be demanded of the truth of his assertions respecting Captain Remington and the Defiance, with the circum-

stances of which, it seems, he was not personally acquainted.—It will be remarked, also, that the date of this case is omitted—perhaps inadvertently.*

4. What is naturally inferrable from the state of the Careenage, the peculiar weather of 1793, and from the contradictory assertions of Dr. Chisholm himself relative to the commencement of the Grenada Fever, is powerfully corroborated by his own account of the progress of the disease, and of the order in which it successively appeared among different descriptions of persons. Like our own Fevers, it was mild or severe, general or partial, in exact proportion to the accumulation or absence of the local and individual circumstances which favoured its attack and extension.

It commenced among *sailors* lately from northern climates, and who were constantly employed in the midst of this horrible Careenage, in this unfriendly season. A moment's attention to Dr. Chisholm's enumeration of predisposing causes will remove any doubt why the disease should first shew itself in this place, if any doubt be entertained. Numbers of young men, from our own country, are every year carried off by the operation of much less active causes. "It must not remain unconsidered, (p. 92.) that "the predisposition of the class of men among whom it happened, was very great. The sailors were from the age of fifteen "to fifty; and the circumstances which appeared to predispose "them more strongly than other men to the action of the contagion, were violent exercise in the sun; the immoderate use "of undiluted new rum; bathing in a state of intoxication, "and often when violently heated; sleeping on deck during the "night. Other circumstances, which did not depend so much "on their own prudence, no doubt, contributed very much to "give the disease so very fatal a tendency: the damp heat between decks; the excessive filth of most of the ships; and "the uncleanly state of the persons and clothes of the men themselves." Now what madness or malignity must possess a man to seek elsewhere for causes sufficient, in connection with climate, season, and the local situation of the people, to breed the most terrible of plagues? In this paragraph, are enumerated all, and more than all, the causes which operated at Bulama, in a situation more healthy; and in a climate and season no more unfavourable to health. Nor need there be any surprize excited by the superior virulence of the Grenada fever, to that which prevailed among the colonists at Bulama.

From the sailors and people of the shipping lying in the Careenage, the fever spread itself among the residents on the immediate verge of this inlet: among human beings enveloped in impure

* The dates of all the other cases are carefully noted.

sir, buried in filth, and devoted to prostitution and drunkenness: amid wretched habitations, huddled together, exposed to the noxious exhalations and noisome effluvia of the Careenage, directed more particularly upon them by easterly winds; and nearly sheltered from the purer breezes of the open sea, by a hill whose steep ascent conducts into the principal and best built part of the town.

" It will not appear extraordinary," says Dr. Chisholm, p. 94. " that the lower classes of men, and those more especially of loose " and debauched manners, should be the most subject to this " disease; their greater exposition to the influence of infection, " which their business as tradesmen rendered necessary, contributed " not a little. But the description of men by far the most ob- " noxious to this contagion, and who suffered most from it, were " those lately arrived from Europe; and of them, those who had " never before been in a hot climate."*

The same circumstances occur in the United States: emigrants, especially those who are poor, ill-lodged, ill-fed, and intemperate, suffer first; and next, those of our own people who most resemble them in situation and habits.

After the appearance and considerable prevalence of the fever on shore, the garrison became affected. Dr. Chisholm lays much stress on its vicinity to the Hankey, and a consequent supposed communication between the soldiers and that vessel. But, for the general reasons that exist for suspecting the testimony of this writer relative to the origin of the disease, this opinion does not seem deserving of any particular credit; especially when it is recollected that the garrison was also near the Careenage, and that the disease " proved fatal only to recruits who had lately joined." Nor will it deserve to be considered as " a circumstance rather " extraordinary," that the fever should break out among " the " detachment of the Royal artillery," though " that corps were " quartered in a situation far removed from the focus of infec- " tion, " when the reader is informed that the station of this detachment was directly upon or by the side of the offensive *marsh* at the head of the Careenage; that " the predisposition of the men to " receive infection, as far as that could be induced by excesses in " drinking and other irregularities, was by no means less than that " of the sailors, &c." and that, though of those who had been long enough in the country to become seasoned to it few died; yet, of twenty-six new-comers, twenty-one fell victims to the fever.

The table which Dr. Chisholm has inserted (p. 100.) of the order in which the Pestilential Fever seized on the different classes of persons, or of the degree of their exposedness to the disease and to a fatal termination of it, perfectly corresponds with what has

* See likewise page 202, & fequent.

uniformly been observed in the United States, and is in all respects such as might rationally be expected, from the operation of those local causes which will, sooner or later, be generally admitted as the originators of these formidable disorders.

Nor is the progress of the disease, in regard to place, less evincive of its local origin. It commenced at the Careenage; extended over the adjacent wharves; proceeded to the lanes and narrow alleys and streets in their vicinity; and thence into the nearest parts of the town. But it never obtained any general prevalence in the neighbouring plantations, nor even in the higher, better built, wealthier, more airy, and cleaner parts of the town.

The situation of the buildings on the Careenage, in respect to the rest of St. George, resembles that of Water-street and Front-street in Philadelphia, the ascent from one to the other, in both cases, being about equally steep; and the Bay-side of St. George may be compared to the North-River-side of New-York, which has hitherto been exempt from pestilential diseases: an exemption of which it may perhaps be deprived, at some future period, by increase of business, and the erection of a few more streets on made-ground. The width of the two cities (New-York and St. George) is also about the same. But, as in New-York, so it will be remarked, that in St. George's, those whose business led them to spend most of their time in the neighbourhood of the Careenage, were by no means safe from the fever, though their houses were in healthy situations. Still, as they sickened in more pleasant places, and were in every respect well-accommodated, the disease in them was, as Dr. Chisholm observes (p. 93.) "in-"finitely milder," and could scarcely be called the same. Yes, this terrible pestilence was reduced to an ordinary fever, or a disease of common malignancy, when it happened among the wealthy inhabitants of St. George, who resided in high, clean, and well-ventilated parts of the town. The same has been the case in New-York; and has, in not a few instances, led practitioners to maintain the existence of a variety of fevers, and to suppose that the gentle means which succeeded perfectly in these mild cases, were equal to a combat with the most malignant forms of pestilence. But passing this error without further notice at present, it is evident, from several parts of Dr. Chisholm's publication, that considerable variety was observable in the symptoms of the fever he describes; and that in some cases, it bore a sufficient resemblance to the Yellow Fever of other seasons, to incline many persons to believe it not altogether distinct. "When this disease "first appeared here, (p. 146.) and for some time after, the pre-"valent opinion was, that it was the Yellow Fever of the West-"Indies, engrafted on the European Jail-Fever." "In some

"protracted cases on shore, and in some among the sailors, which "might have been a combination of the Pestilential and Yellow "Fevers, this symptom *(a yellow skin)* appeared about the fifth, "seventh, or ninth day." With the reader who is apprised of Dr. Chisholm's motives for wishing to establish a distinction between the ordinary Yellow Fever of the West-Indies, and the Grenada Fever of 1793, these concessions, notwithstanding all the author's endeavours to destroy their force, will have their due weight. The philosophical inquirer will find little difficulty in conceiving that a disease, which, in ordinary seasons, he is told, is endemic and sporadic, in Grenada; (Chisholm, p. 147.) and "is evidently "caused by marsh effluvia, heat, violent exercise in that heat, "thick, hot, moist atmosphere, night air and dews, and the abuse "of spirituous liquors"—may be exalted to a higher degree of virulence and activity by a more than usual combination of these causes, in a season favourable to pestilential disorders. He will even derive new reason for his conviction on this point, from the assertion (in the same page) that the Yellow Fever is *never known to be contagious*, when he reflects how intimately the immediate sources of fevers are connected with those complaints, and how remarkably the progressive extension of pestilence compares with the gradual impurification of the ambient atmosphere.

5. A still further confirmation of the opinion meant to be advanced in this essay, in opposition to the assertions of Dr. Chisholm, concerning the origin of the Grenada fever of 1793, may be discovered in the effect which was produced in the sick, by their removal from the ships and low places where they first became sick, and were still exposed to the operation of the original causes of the disease. While they remained in these situations, the pestilence assumed its most threatening aspects, and all the skill of the physician was frequently unable to rescue them from its fury. If subdued to a certain degree, it yielded but in the most gradual manner, and the convalescence was tedious and protracted, from the extreme difficulty of generating new habits, while the system was continually operated on by the causes most powerful to counteract them. But, when removed to a high and airy situation, the sick found an almost immediate mitigation of their worst symptoms, and the return of health and strength was nearly consentaneous with the disappearance of disease. Were this not the fact, it would well deserve our astonishment. But in what respect does this differ from what is ordinarily observed in the commonest and slightest forms of fever? Who is ignorant that the attacks of an intermittent are more readily obviated, when the patient leaves the neighbourhood of a marsh, and fixes himself on a dry and elevated station?

6. Another circumstance deserving of attention, is the obvious

difference between the Grenada fever, and diseases of specific contagion.

It is true, that very great dissimilarities are observable in the degree of violence with which the small-pox and measles affect different individuals; and that these diseases are modified by situation, diet, constitution, cleanliness, &c. But still they are contagious. It is not found that, notwithstanding these circumstances modify, they extirpate or destroy their contagious property. Who is able to produce an instance of the total disappearance, within a few weeks, of an epidemic small-pox or measles, where they have not been driven away by new epidemics, or where the subjects of their attacks were not exhausted, or had not been removed from their reach by social regulations?

If the Grenada fever was of the same nature, why did it not extend to every part of the town of St. George, and over the whole island? What was there, in so warm and equable a climate to arrest so suddenly and totally a disease of specific contagion? Why was its course always impeded or stopped by a pure air and personal cleanliness? Why did it respect natives more than foreigners? of the first, those whose situations were, on other accounts, most eligible? of the last, those who were most careful and temperate? Does any one suppose that either of the diseases above-mentioned—that the small-pox or the measles—would have been so complaisant?

The true causes of these varieties are sufficiently evident. Men, in general, can never materially change their climate and situation, without exposing themselves to a correspondent alteration in their health. Those who remove from northern to southern climates, must expect to experience some morbid variation of it. Its degree and danger will depend on the extent and suddenness of the change of climate, and on the peculiar circumstances of place and person, food and season. The disease to which men, who go from the higher latitudes of Europe and America to the West-Indies, are commonly exposed, is that form of pestilence which is called Yellow Fever. This disease is much more mortal in some years than in others; being, like other general diseases, modified by season, &c. To so high a grade of pestilence, the natives or long residents of the West-Indies are comparatively seldom subjected: the same causes producing, in persons habituated to their influence, the milder forms of remitting and intermitting fevers. Individual misconduct (as intemperance, &c.) occasionally excite, even in them, the worst kinds of fever; and, in particular seasons, persons of irregular lives, who reside in the midst of the accumulated causes of pestilential diseases, fall victims to their carelessness, in common with new-comers from more temperate regions. And such appear to have been the facts in Grenada in the year 1793.

Viewing the fever of that year as originating in local causes, rendered unusually active by the circumstances of season, &c. there will be no difficulty in accounting for its disappearance; without the encumbrance of the objections opposed to the doctrine of its being a disease of specific contagion. For,

I. There is reason to believe that a considerable part of the persons peculiarly exposed to the fever, had either died of it, or, having been sick, had recovered, and thus gained an immunity from a second attack for that year, and perhaps forever.

II. A large number of sailors, a description of men remarkably subject to the disease, were sent away from Grenada, about the last of August.

III. But the most material circumstance, probably, was the setting in of violent and long-continued rains; accompanied "with "most vivid lightning and tremendous thunder, and violent "squalls from the south-east." The rain which commenced so violently in September, continued through the greater part of October, almost all November, and the following December. Here, then, is discovered a cause adequate to the thorough purgation of an infected atmosphere; to the complete ventilation and cleansing of filthy streets and docks; and to the wholesome overflowing of a pestilential marsh.

It will avail the advocates of importation very little to remark, that the course of similar fevers in the United States, finds its only effectual enemy in cold and frosts. These obstacles can not operate in the West-Indies, as they do not exist there—at least, not at St. George's in Grenada, where the mean height of the thermometer is about 80, during the whole winter. Other causes of the discontinuance of pestilential diseases in that climate, must be sought after; and there can be little doubt but that those above-assigned, were in fact, operative and successful in the present instance; especially when it is remembered that the fever of Grenada wholly disappeared in the course of the tempestuous month of September, 1793. And hence a new argument against the doctrine of importation may be derived, as the difference observable in the operation of similar diseases in different countries, shews how far even the morbid seeds of pestilence are adapted to the climate in which they are destined to be sown and to vegetate. If there were not some variety of this nature, why should not the same cause arrest its progress and, effect its banishment, in the United States, that is adequate to these beneficial purposes in the West-Indies? Nor is the supposition any objection to the moral dispositions every where manifested in the universe. Vice and suffering constantly preserve an intimate connection. Their severance would be alike the signal for the overthrow of all virtue, and the demolition of every hope of happiness. The sources of pain,

no more than the occasions of vice, are limited to a particular climate and country; and they who wantonly indulge in intemperance, and obstinately neglect to remove the causes of disease, have no reason to complain of the visitations of gout, stone, dropsy, and pestilence. With the amendment of their own lives, and the correction of their own negligence, their miseries and their danger will disappear. Let them fulfil the injunctions of reason, and they will find no cause to inveigh against the injustice of heaven.

The principal reasons have been now displayed for discrediting the assertion of Dr. Chisholm relative to the introduction of the Grenada Fever, into that island, from Bulama, by the Hankey. A few remain to be disclosed, in an attempt to discover the motives of this author, for a misrepresentation so atrocious. These will be stated as briefly as possible. It may be proper, first, to remark, that none of the people who came to Grenada, in the Hankey, were sick there, at all, except Capt. Cox, whose intermitting fever did not entirely take leave of him till after his final departure for Europe.*

It will be remembered that the expedition to Bulama was set on foot by an Association of philanthropic gentlemen in England, with an express design of counteracting, as far as possible, the iniquitous traffic in human flesh; and, as a principal means of effecting this purpose, for the culture of those commodities which are the prime articles of exportation from the West-Indies, more especially of cotton. It will naturally be supposed that an enterprize like this would be regarded with evil eyes, by the West-India planters; to whose opposition and intrigues the shameful delay of justice in the British Parliament, is chiefly to be attributed. With what temper Dr. Chisholm regarded this effort of the friends of man; by how different principles he was influenced; or, at least, how ready he was to sacrifice truth at the shrine of prejudice and the wishes of his West-India patrons; is evident from his own words, when, speaking of the motives which determined the colonists to embark for Bulama, he describes them as "induced by "the delusive prospect of wealth *held out to them*," (an indirect charge on the benevolent projectors,) "and the *fanatic enthusiasm* "*for the Abolition of the Slave Trade, &c.*" Who can doubt of the perversion of his understanding, or the pliancy of his faith, that recollects Dr. Chisholm's *voluntary* declaration to Mr. Paiba, that he was convinced of the local origin of the Grenada Fever,

* He arrived at Grenada well; but from subsequent inattention, and perhaps irregularity in returning too hastily to the indulgences of healthy men, suffered frequent relapses, or returns of the ague; but was at no time dangerously ill.

and that a similar disease had prevailed there, a few years before, from similar causes? Is it possible to credit the assertions of such a man on a point like this, when he is proved to be guilty of such palpable tergiversation, and when the violent and atrocious measures employed by the Grenadians are recollected and considered? What they were, and how successfully they were renewed and seconded in England, will be evident from the following extract of a Report from the Trustees of the Bulama Association, to a meeting of the subscribers, which the reader will find by referring to p. 159 of Part II. of an "Essay on Colonization, &c." By C. B. Wadstrom, published in 4to. at London, in 1794.*

"Having thus stated," say the Trustees in their report, "the "proceedings at Bulama, to the 16th of March, 1793, it is neces- "sary to remind the Association that, about that time the sub- "scribers here had several meetings, to consider what could be "done for their friends at Bulama, for whose safety the want of "information had excited serious apprehension.

"About the same time, the Hankey, Capt. Coxe, arriving from "Grenada, with sugar, cotton, &c. an extravagant, unfounded, "and malicious rumour was raised, that this ship had brought "the plague from Bulama to Grenada, and thence to England. "It might easily have been ascertained, that the mortality at Gre- "nada, while the Hankey was there, was owing to one of those "disorders to which the West-Indian islands are unfortunately "subject. But, so flaming was the zeal of the Grenadians against "the Abolition of the Slave-Trade, and the *free* colony at Bula- "ma, that they employed every illiberal art to prevent Capt. "Coxe from getting a cargo at Grenada. But their malice did "not end here: they sent home representations, or rather mis- "representations, respecting his ship, which were so strenuously "supported by the West-Indians, that Government thought it "proper to put the Hankey under quarantine, and to have her "cargo unloaded and examined, before it was brought up the river. "*Every examination proved the falshood and malignity of the report.* "Yet several months elapsed, before the owners could unload "their ship. Lightermen, wharfingers, and lumpers, all had "caught the West-India Fever: all believed, or pretended to be- "lieve, the imposture. Grave citizens and official men, were not "ashamed to countenance the wild opinion. Magistrates and "members of the Corporation of London, were applied to, for

* It should be remembered that this is not a vague accusation from a few obscure individuals, but that the Report above mentioned, comes from men of the first character in Great-Britain, for probity, talents and information; from men whose situations and inclinations alike enabled and disposed them to obtain the most decisive evidence as to the facts they publish—their names have already been inserted at page 473.

" their influence with government, to avert the impending pesti-
" lence. And, so successfully was the deception managed, that, on
" the famous 9th of November, a citizen of the greatest respect-
" ability, then master of one of the first city companies, forgetting
" that his sole province on that day was to dispense mirth and good
" cheer, sent to the lord mayor and aldermen, then on board the
" city barge, a representation of the alarming consequences that
" would ensue, if this terrible ship and her cargo were not destroy-
" ed! the *alarmists* gravely asserted that *all the Hankey's crew had* " *died, and that the Captain was dying.* It is true, that Capt.
" Coxe had almost died with grief, from the report cruelly circu-
" lated respecting his ship. But it is equally certain, that *not one* " *of the crew had died*, either on the passage from Grenada, or in
" the river. The calumniators, however, had in view another
" object than truth; and their success was such as might gratify
" the most malignant spirits; for they had nearly caused the death
" of a man, who had never offended them, and materially hurt
" the property of the ship's owners, and, what must have been still
" more pleasing to *them*, greatly injured the Bulama Association.

" The prejudices thus industriously raised against the colony at
" Bulama, and which, from the want of information, it was (at
" that time) impossible to repel, deprived the trustees of all hopes
" of success in *then* applying for a charter. They preferred wait-
" ing till the torrent of malicious, or ignorant clamour had spent
" itself, and till time and undoubted intelligence should confirm,
" or contradict, the reports. The prejudices against Bulama, ren-
" dered it extremely difficult, if not impossible, to succour a colony,
" *then deemed pestilential;* and there can be no doubt that this was
" one great object of the calumniators."*

IT is now time to close this Essay, which has already extended far beyond the writer's first expectations. The mass of evidence here collected, to disprove the authenticity of Dr. Chisholm's account of the origin of the Pestilential Fever of Grenada, in 1793, is such as may fairly be considered as conclusive. It is not, indeed, to be expected that the supporters of the theory of imported contagion will relinquish their general doctrine, though they should fail of deriving any countenance from what occurred in Grenada. The notion of importation has been too long, and too confidently maintained, to be abandoned while a single colourable pretext in its favour, or a single subterfuge remains. But, it may be remarked, in concluding, that there is great reason to believe that a well-conducted inquiry into every other pretended instance

* The paſſages in Italics, are ſo marked in the original.

of imported contagion would terminate, equally, in satisfactory evidence of local origin; or, at least, would discover abundant causes for hesitation and doubt as to its foreign derivation.

SINCE writing the preceding Essay, I have again looked over a paper, by Dr. Chisholm, published in the Edinburgh Medical Commentaries for 1793, and intituled "History of an Uncommon "Epidemic Fever, observed in the Island of Grenada, &c."

This disease, which resembled in many striking particulars, the Yellow Fever of the United States, which it differed from in others, is attributed by the author of the paper to *marsh miasmata*, or more properly to *local causes;* and there is every reason in the world for believing this opinion to be correct. The date of the occurrence of this fever is September, 1791. It appears to have ceased about the first of January 1792.

The symptoms which resemble those of the Yellow Fever, are the inflammation and protrusion of the eyes, the intolerable headach, delirium, coma, yellowness of the skin, rawness and burning in the throat and stomach, and dark stools. Other general similarities are observable.

The effects of various remedies constitute another strong analogy between this Grenada Fever of 1791, and our fevers, and the Grenada Fever of 1793. Bark generally aggravated the symptoms; bleeding gave relief, and the blood was sizy; and mercury, used to salivation, was a certain cure.

When these additional facts are taken into view, and considered in connection with what has gone before; with the extensive examination which the subject has undergone in America; and with the facts and reasonings advanced by Mr. Webster, in his letters to Dr. Currie, relative to *general contagion*, and which will receive additional confirmation in his Treatise soon to be made public; it would seem impossible for any mind, however subjugated and bigotted to former opinions, to resist the force of this accumulated weight of evidence. And it certainly deserves to be regarded as a very singular fact, that a man who seems to have observed and thought so correctly as Dr. Chisholm did in 1791, and who held such opinions as he then professed, should have taken ground so very different in 1793, and with so little shew of reason to justify the change. As the Medical Commentaries have a general circulation in the United States, it is to be desired, that those gentlemen who feel themselves interested in the present inquiry, should not neglect to compare the paper of Dr. Chisholm, here referred to, with his treatise on the fever of 1793. It can scarcely happen that they do not find themselves confirmed in the belief of the local origin of the diseases of both years.

March, 1798.

ARTICLE IV.

Some Account of a PESTILENTIAL FEVER, *which prevailed in the Island of Jamaica, in the years* 1793, 1794, *and* 1795. *Extracted from a Paper presented to a Medical Society in that island, by Dr.* JAMES WALKER.

THE Paper from which this Extract is made, appears to have been read by the author, to a Medical Society at Port Royal; which society had then lately been instituted, and originally for the purpose of observing the progress, studying the nature, and perfecting the cure of the disease to which it relates.

The author ascribes the origin of the disease to a ship from Grenada, which is supposed to have introduced it into Port Royal. Of this, however, he offers no evidence; and subsequent remarks would induce a conjecture that he held a different opinion.

The first attack was sudden, and without any previous indisposition of the person seized. It began with violent head-ach, and a remarkable throbbing of the arteries; frequently subsiding within an hour, and succeeded by apparent inanition, a low, quick, and feeble pulse, and shining, watery, or glassy eyes, almost destitute of expression. Irritability of the stomach was a pathagnomonic sign. At first, nothing was ejected but the natural contents of the stomach; after repeated efforts and much straining, mucus and bile were thrown up; and afterwards, generally about the third day, a matter resembling coffee-grounds, and sometimes of the colour, consistence, and tenacity of tar. Hemorrhagies were frequent, from the mouth and nose, and sometimes from the axilla, anus, and vagina. The respiration was laborious; the languor and debility great; and the fever neither intermitted nor remitted. Near the close of the disease, in those cases which terminated fatally, a yellowness appeared first in the eyes and on the neck, gradually extending over the whole body, and acquiring a darker hue. Very few had petechial eruptions.

The character of this fever underwent some alteration in the year 1795. In 1793 and 1794, it never intermitted, and its duration seldom exceeded five or six days, but it more commonly terminated in two or three. In 1795, it was sometimes protracted to the sixteenth and twentieth day, and generally to the ninth and tenth. At first, it was confined to newly-arrived Europeans, such as seamen, soldiers, and passengers; but was said to have affected some of the old residents of the interior of the island in 1795. Of

this, however, the author had no personal knowledge; and appears to doubt, as he thinks the disease not communicable from one person to another; in support of which opinion he remarks, that "in the public Hospital, where many people were necessarily in "the same wards with numbers in this fever, neither any of them, "nor of the attendants upon them, were infected."

Several dissections were made by the author. Nothing was observed in the brain, further than that it appeared less full of blood than is sometimes seen. The pleura, peritonæum, lungs, pericardium, and intestines, were perfectly natural. No signs of fulness or inflammation on the liver, except a slight redness on a small portion of the membranous covering of the convex side. A slight appearance of inflammation was observable on the villous coat of the stomach. The gall-bladders were distended with thick black bile, of the consistence of tar, and some of the same substance was found in the stomach. The hardness and tenacity of this black matter was increased by the addition of a solution of volatile alkali (ammonia). Vegetable acid, poured on another portion of the same tarlike substance, excited considerable effervescence, which continued some time; after which the mixture assumed the colour and consistence of healthy bile. Whence the author infers, "that the acrimony of the disease, or the morbid "bile, has an alkalescent tendency."

As a preventative, beside temperance and cleanliness, the author recommends the exhibition of mercurials; and seems to think that they may be advantageously continued even to the producing of a gentle salivation. He relates one fact, as connected with this point, which, as it is curious and probably little known, may properly be given at length, and in his own words. "A circum-"stance, worthy of notice, happened last war, at the taking of "Fort Omoa on the Spanish Main; which Dr. Clark, then sur-"geon to the Pomona frigate, on that service, communicated to "me. It may be in the recollection of most of us, that a malig-"nant fever broke out there, with the type of a marsh fever, "which swept away great numbers of men from all the squadron, "but was also so fatal on shore, that the 79th regiment alone lost "eight officers. Among the ships which were captured in that "harbour, one was loaded with *quicksilver*, for the use of the "mines; and the vessels which contained it being broken by the "shot of the Pomona, the mercury was found floating in large "quantities, and a number of men were sent on board to collect "it; which they did with their hands, by throwing it into pails "or buckets. These men were continued in this employ, during "all the time they remained there; and not a man of them had the "smallest complaint, though surrounded by disease and death."

The method of cure generally practised at first, in 1793, con-

sisted of bleeding, cooling laxatives, and antimonials in small and frequent doses; and, as the pulse was observed to sink very fast, recourse was had to blisters, and the bark. Blisters, the author thinks, often relieved the anxiety at the precordia; which was also sometimes removed by opiates. Every preparation of bark was rejected; on which account they gave it by injection; and as the signs of debility fast increased, administered snake-root, camphor, brandy, and other stimulants, with elixir vitriol, subacid drinks, &c. &c. This plan of cure was very unsuccessful. Bleeding increased the debility; emetics excited an irritation of the stomach, which nothing would allay; and it became necessary to have recourse to some more efficient aid. This, happily, was discovered in mercury; and as the result of very extensive practice in this disease, and with this remedy, the author lays down, as the most efficacious, the following method of cure.

1. Calomel is to be given in pills, or what is better suspended in mucilage, [that of the Maranta or Indian Arrow-root is particularly recommended], at such intervals, and in such quantities, as the exigency of the case may require; observing that, as the object of the physician is to procure ptyalism as soon as possible, it must be vigorously pushed. To render this the more certain, the same medicine must be rubbed into the gums and lips, and mercurial ointment on the arms, legs, &c. The throat of the patient must be kept warm with flannels; he must inhale the steams of hot water—irritate the fauces with stimulating gargles, or with masticatories of arum, pyrethrum, &c. &c. If by any, or all, of these means a salivation is excited, we are told that there are few instances of the disease proving fatal; and not one has occurred to the author. More commonly, the fever immediately disappears altogether, or very much abates, and yields easily to ordinary means.

2. The pain of the head is to be relieved by rubbing it with vitriolic æther, or sliced limes and salt.

3. The bowels are to be kept open by means of clysters.

4. The mildest foods and drinks are to be given.

5. The bark may be administered, after the disappearance or great abatement of the symptoms, in such form as is most agreeable to the patient.

6. The inconvenient ptyalism which sometimes continues long after the fever is subdued, Dr. Walker thinks is more certainly obviated by blisters to the back, than by the means customarily employed.

The following brief notices of cases in which mercury was used will give the reader a more complete knowledge of the author's practice.

1. Capt. Stobo took 304 grains of calomel, and rubbed in ℥ i

of mercurial ointment, which produced a ptyalism next day, and he recovered.

2. —— Roberts took 305 grains, rubbed into his gums and lips ʒ ii, and upon his thighs and groins ℥ vi of strong mercurial ointment, containing one third mercury: in five days was salivated, and recovered.

3. —— Kinnear took 525 grains, rubbed upon his gums and lips 600, and ℥ x of ointment on his body, in eight days: took acidulated bark afterwards, and was soon perfectly well.

4. Mr. Sorely. This case terminated unfortunately. He took between 13 and 1400 grains of calomel, and ℥ vi of the ointment were rubbed in; he was also fumigated, and took some small doses of turpethum minerale; but without producing salivation, as was desired. "During this patient's illness, which continued "nine days, he had scarcely any fever, and no symptom of dis- "solved blood, only about the seventh day a few drops of blood "came from his nose, which his nurse attributed to his picking it. "He shewed a little yellow tinge upon his eyes only the day be- "fore he died, and gradually sunk without a complaint, tho' per- "fectly sensible. He only said that his gums were a little sore; "but it is to be observed that he had a diarrhœa the first three "days, which probably retarded the ptyalism; but it was after- "wards necessary to keep his body open, daily, by emollient laxa- "tive clysters." Afterwards Dr. Walker observes of mercury, "I have known it cure a dysentery, but never knew it produce even a diarrhœa."

Other instances are noticed of the successful use of calomel in very extraordinary doses: and one case is referred to, in which a gentleman of the name of Forbes exhibited 1600 grains to a single patient, and produced a cure.

Such are the principal matters in Dr. Walker's paper, which appear deserving the attention of practitioners in the United States. On the whole, whatever may be thought of the method of cure proposed by this gentleman, in pestilential fevers, one fact seems to be clearly ascertained, that calomel and mercurials in general, may be administered in much greater quantities than we have hitherto been accustomed to prescribe them, and if not with advantage, at least without injury.

ARTICLE V.

A Letter to Dr. —— ——, in Answer to his Queries respecting the Introduction of the Mercurial Practice in the Vicinity of Boston, Massachusetts.

By Edward A. Holyoke, *M. D. of Salem, Massachusetts.*

Dear Sir,

WHEN, upon reading some late English publications, you find the exhibition of mercurial medicines in inflammatory diseases recommended as a *new* practice, though the same is so common and frequent in this vicinity; you naturally inquire how long this practice has been in vogue among *us*, and by whom, or by what means, it was first introduced?

I know not whether I shall be able to make you any very satisfactory answers to these queries: I will however endeavour to give you all the information I am possessed of.

A physician from Scotland, who, as I have heard, was a disciple of the celebrated Pitcairn, and who was an intimate acquaintance of some of the first practitioners in Boston, and its neighbourhood, about 60 or 70 years ago, was much in the habit of administering mercurials, and, as I have heard, much promoted their use among us, if he did not originate it.

This practice was much promoted, too, by the writings of Dr. Cheyne, then, and for some time after, much read by physicians here.

But what probably most contributed to give the faculty a high idea of this medicine, and to bring it acquainted with its virtues and uses, was the happy effect it was found to have, in checking the progress of a most formidable disease, which broke out in this part of America about the year 1734 or 1735, and made cruel havoc, sweeping off multitudes of children, wherever its baleful influence extended: I mean the disease at that time called *the throat distemper;* which I suppose to have been of the same genus with Dr. Huxham's *malignant ulcerous sore throat*, tho' it was, I believe, much more frequently and rapidly fatal then, than it has appeared of late years among us, or than it has been at any time in Europe. No remedies, we are told, were for some time of any avail, to stop its career, and almost all who sickened, died. At length recourse was had to mercurials, as *turpethum minerale and calomel*,

and by these, aided by antiseptics, &c. physicians were enabled to make some successful opposition to its ravages.*

It was natural to extend the use of so efficacious a remedy to other disorders, and being found or thought useful in many other cases, it became accordingly much employed.

But at what period, or by whomsoever the mercurial practice might have been introduced, in this part of the country, this is certain, that upwards of 45 years ago, it was in common use, in pleurisies, quinsies, inflammatory rheumatisms, and other phlegmasiæ; with several gentlemen who were at that time of the first repute as physicians. And this practice was not only adopted by their pupils, but by many other practitioners in the vicinity, and has not, since that time, been wholly laid aside, though I believe it has not been so much in vogue lately, as it was from 30 to 45 years ago. The modern European medical writers, who are most consulted and followed, by the faculty here, being totally silent with respect to the exhibition of mercury in fever and inflammatory diathesis, has, I doubt not, been the occasion of its running into disuse of late. The practice has, however, been still kept up by many, and will doubtless go on increasing, now European writers give it their sanction.

An idea that mercurials were improper, if not injurious medicines, in inflammatory cases in general, seems to have been adopted by physicians in Europe;† but certainly without just foundation, if the above account deserves credit; or if we may believe several European performances lately published; particularly a paper written by Dr. Wright, and inserted in the 7th volume of *Medical Facts*, entitled, *Practical Observations on the Treatment of acute*

* I remember to have heard a little anecdote, which may be worth relating on this occasion.—A practitioner in a neighbouring town, of great repute and extensive practice, being called to attend a young woman dangerously ill of this distemper; having ordered her, among other things, four or five grains of calomel, was astonished the next day to find her relieved, greatly beyond his expectations. Upon inquiring of his pupil, to whom he had given his directions, whether his prescription had been followed; he found that his patient had taken 30 grains of calomel, instead of four or five: to which mistake he attributed the cure. From this time forward, in very dangerous cases, he used the medicine in much larger doses than before.

† I well remember, that, about the year 175—, Dr. Charles Russel, a young physician, (who had been pupil to a gentleman who employed mercurials in his practice very freely) then lately returned from London, where he had been some time attending at a public Hospital (Guy's or St. Thomas's), informed me, that upon his relating to the medical gentlemen there, the common practice in this part of America, of administering mercurials, particularly calomel, in inflammatory disorders, that they expressed great surprize at the account, and told him they should have apprehended, the most fatal consequences from such a practice.

Diseases, &c. The encomiums Dr. Wright bestows upon the administration of mercury, in a variety of acute cases, so well accords with our long experience of its efficacy and safety, in this country, that every practitioner amongst us, who has been in the use of it, will readily accede to them.

For my own part, I profess myself to have been in the habit of prescribing this mineral ever since the year 1751 or 1752. About that time, pleurisies and peripneumonies were remarkably prevalent, and might be called epidemical: the practitioners of this place made free use of it at that time, and, as we found its effects beneficial, have continued to employ it in similar cases ever since.

It is not pretended, however, that this practice is universally successful, or that it is admissible in all subjects: some persons, as experience shows, cannot bear mercury; a great degree of debility, and irritability, being the immediate consequence of its exhibition, even when given in very moderate doses. Others, from great tenderness and irritability of bowels, seem incapable of admitting a quantity of the medicine sufficient to affect the system. And others, from a certain peculiarity of constitution, though the bowels bear it well, are but little apt to be affected by it, although it be taken freely, and for a considerable length of time. But so far as my recollection serves me, I have never known a failure in pneumonia, where the patient began to take it early, could bear it well, the mouth became sore, and a gentle ptyalism came on in a few days.

The preparation of mercury most commonly made use of was mercurius dulcis, or calomel; in larger doses joined with some purgative, when designed to act as a cathartic; and in smaller doses, of one or two grains, as an alterant, or when the intention was to affect the system: and then it was frequently combined with *camphor*, and sometimes with some preparation of *antimony*, and sometimes with small doses of *opium*; or with all of them together, as the prescriber judged most proper: though, in some cases, the native mercury, rubbed down with Terebinth, &c. was preferred.

Beside these, the *turpethum minerale* was often given in a few grains (from one to four), with a little *ipecac.* as an emetic; than which the *Materia Medica* does not, perhaps, afford one more certain or more efficacious; especially in inflammatory quinsies, the croup, or generally when tenacious phlegm or pituit abounds in the stomach. Small doses, too, of this last preparation, as one third, or half a grain, given in a little cons. rosar. or honey, and repeated at short intervals, as two or three hours, have been found to be most powerfully expectorant, in pneumony, where the lungs have been greatly obstructed and loaded with viscid phlegm: and I have seen a number of instances, where patients who seemed on

the point of suffocation, were snatched from the jaws of death, by a few doses of this medicine.

My intention in this letter, however, you are sensible, is not to enter into the mode of exhibiting mercurials, much less to treat of any particular disease; my design is merely to answer your queries; to corroborate Dr. Wright's practice, by showing how it corresponds with a practice that has long been common among us here; and to show, that, in this part of the country at least, the same medicine has been successfully employed, certainly for nearly half a century, and probably much longer.

I am, &c.

E. A. HOLYOKE.

Salem, December, 1797.

ARTICLE VI.

An Account of the PESTILENTIAL FEVER *which prevailed at Newbury-Port, State of Massachusetts, in 1796; in a Letter to Mr. Smith.*

By Dr. CHARLES COFFIN.

SIR,

IT gives me pleasure to find the plan proposed in your Address, undertaken in this country; and I hope you will be able to prosecute it with success. I should be happy to contribute in any degree to your assistance.

Respecting the origin of the disease, which raged here in 1796, there have been but two opinions. Some have supposed it was generated here; others, that it was imported from the West-Indies, in a vessel which arrived in May. Having never had an opportunity, till very lately, of conversing, as I wished, with the Captain himself, I was not prepared to state all the facts with certainty relative to the suspected vessel. The Captain's account is, that about twelve days before his arrival here, two of his men died on board of a putrid fever. After which he immediately cleansed the vessel, by washing it with vinegar, smoking it with tar, and dubbing the cabin and steerage floors. He threw over the clothes, which the sick had worn, and their bedding. Their other clothes were locked up in their chests, and afterwards sent home to their friends, in a neighbouring town, without communicating any infection. The rest of the crew escaped the disease. Here it may be remarked, that if the vessel, on her arrival, had been stationed at some other part of the harbour, it would have been conspicuous, whether it brought the fever or not. But not far from the wharf at which it was unloaded, a great quantity of fish had been dressed for the West-Indies; and the entrails left exposed to the air. The weather being uncommonly moist and warm, the exhalation was very offensive to the neighbourhood. In one of the houses nearest to the fish offal, the three first persons were seized with the disease; and within twenty or thirty rods the greater number of its victims lived. The majority of those who recovered, lived in other parts of the town. Most, if not all, who had it at a distance, had frequented the infected neighbourhood; but did not communicate the infection to their attendants. These are the principal facts, from which the fever's origin must be determined.

The symptoms were various. Most were seized with violent pains in the head, loins, stomach, and abdomen; great oppression upon the præcordia; nausea and vomiting porraceous matter; great sense of cold, especially in the extremities; and a burning heat in the intestinal canal, followed with loss of strength. Others complained more of pains in their arms and legs, with a general lassitude, and but slight sense of chilliness or oppression upon the præcordia. The pulse in the robust was, at the onset, somewhat hard and full, but in most cases small and weak, especially in the advance of the disease. The tongue at first was generally covered with a thin, whitish fur, which afterwards became thick, dusky, and often black in the middle. The skin, in a few instances, almost retained its natural appearance, but generally became sallow and yellowish; and, in two or three cases, of an orange colour. An indisposition to sweat, and some stricture upon the skin, were common. The eyes were spiritless, yellowish and sometimes red. The stools, in some, at the beginning, were nearly of a natural colour and consistence, but more frequently yellow; and in the progress of the disease, generally changed to a bottle green, and sometimes to the colour and consistence of coffee grounds. The urine was reddish and turbid, and sometimes, of a greasy frothy appearance. The crassamentum of the blood taken away was loose, and the serum very yellow. In the two first days there were irregular exacerbations. On the third or fourth, the fever and other symptoms often abated, and the patient felt almost well. This mitigation was frequently fallacious, and followed with vomiting of black bilious matter, like coffee grounds, together with great soreness of stomach, restlessness, dejection, and delirium, which issued in death. Livid spots appeared on the arms of some, and the extremities of many were cold and livid, several hours before dissolution.

The method of treatment was regulated by the symptoms. When there was any hardness or fullness in the pulse at the beginning, bleeding was used with advantage, and sometimes repeated. Emetics and drastick purges were found detrimental. Manna and Glauber's salts, dissolved in tamarind water, were copiously given, and with great effect. The patient's strength seemed to be increased by their operation. Spirit. Nitr. Dul. Elix. Camph. Spt. Minder. and Haust. Sal. were used in the intervals. In cases of dejection, languor and cutaneous stricture, blisters upon the arms and nape of the neck were very serviceable. The cortex, when it produced no tightness in the breast, was beneficial. The diet was oatmeal, panado, ripe fruit, salop, &c. The drink was lemonade, tamarind water, almond emulsion, &c. Clean linen, and clear cool air, were very necessary. Sometimes the heat in the stomach and abdomen was so great, that linen cloths, dipped

in cold vinegar, and applied externally, as well as clysters of equal parts of cold vinegar and water, injected, were very refreshing.

Of those who had the fever, a full third recovered. Many others were slightly affected, who, by gentle purges, antiseptic diet, and pure air, escaped. According to the list of the Committee of Health, the number of those who died in town did not exceed forty; and if all those were added who took the disorder here, and died out of town, it would not exceed fifty. Some died on the fourth, fifth, sixth, and seventh days, and very few after. The committee were very careful, by removing nuisances, to promote purity of air in all parts of the town. The first appearance of the fever was on the 16th of June; the last instance of its fatality, on the 16th of October, and the last but one, on the 5th. As the coolness of the weather increased, its rage was mitigated, and gradually extinguished. It is worthy of remark, that the whole number of deaths, in the course of the year, was greater than usual.

The above particulars, I believe, Sir, may be relied on; and if they reach the object of your polite letters, it will afford pleasure to your humble servant,

CHARLES COFFIN.

Newbury-Port, Feb. 15, 1798.

ARTICLE VII.

Singular Cases of Disease in Infancy. Communicated in a Letter to Doctor JAMES HAMILTON, *Junior, of Edinburgh, by* DAVID HOSACK, *M. D.*

New-York, February 20, 1798.

THE following cases of disease in infancy I have several times met with in practice, but do not recollect to have seen described by any writer upon the diseases of children. Underwood has given a sketch of a disease in infancy, proceeding from what he calls "an imperfect closure of the foramen ovale,"* which bears the greatest resemblance to it of any thing I have seen described: perhaps it may prove the same disease; but as Doctor Underwood has not described all the symptoms which characterise it, and as with him it has proved uniformly a fatal disease, I trust the following account of it, and the mode of treatment which I have found successful, will not be unacceptable.

CASE I.

ON the morning of the 30th October, 1797, I was sent for to visit a child of Nathaniel Pendleton, Esq. of this city: it was seven days old, of apparently good constitution, and had been in perfect health from its birth.

I was informed it had been suddenly taken ill in the night, and that it awoke with an unnatural screaming, which was the first symptom of its indisposition. Mrs. Pendleton considering its complaints to proceed from some disorder in the bowels, gave it a dose of *castor oil*, which operated freely, but without any abatement of its symptoms: a drop of *laudanum* was then administered, but without the smallest benefit: the child still continued screaming every few minutes, but after each fit it was perfectly quiet, and apparently free from pain; but would not take the breast. Finding no relief from the oil or opiate, Mrs. Pendleton became alarmed, and early in the morning I was called to visit it. In a few minutes after I had entered the room, it suddenly screamed out two or three times. I at once perceived that this was not the natural cry of the child, and took a seat with the view to examine its symptoms more particularly. The fits of screaming returned about every ten or fifteen minutes; immediately after each fit, the countenance appeared natural, both as to the complexion and

* See Diseases of Children, vol. i. p. 62.

composure of its features, and the pulses beat with their usual frequency; but in the course of about five or six minutes, respiration became entirely suspended; the eyes now assumed a vacant stare; the countenance changed its colour; instead of the natural florid hue, it became of a dark livid blueish colour: this change was first perceived about the upper lip and chin, and was apparent to every bystander: the pulses became less frequent, and very irregular: in about eight or ten minutes the blueness was extended over the whole face; the extremities underwent a similar change of colour, attended with some coldness: at this time the pulses were scarcely to be perceived: in a word, the child, at this moment, manifested every symptom of approaching death. In this critical state of things it again suddenly screamed, throwing out its arms and legs as in convulsions, and took two or three violent inspirations: after these efforts, respiration was again entirely suspended; but, notwithstanding, its circulation was again for a short time restored; the leaden colour of its countenance disappeared, and its natural complexion, for the moment, perfectly returned. These last favourable symptoms did not continue: as before, in a few minutes, respiration being entirely suspended, the countenance became livid and blue; the circulation became slower and very irregular, and the extremities lost their heat. Such was the condition of the child, until another fit of screaming restored the respiration for a moment, which gave new energy to the circulation. I was now satisfied that the bowels had no connection with its present complaints. Having seen the disease in three other children, I readily recognized it; but as, in all those, it proved fatal, I had not the smallest expectation of its recovery. In those cases evacuations were first employed, and afterwards anodyne medicines were administered, upon the principle that the disease was of a spasmodic nature; but as these remedies were not attended with any relief or advantage, I resolved to try the effect of a stimulant mode of treatment. Accordingly, I applied a small blister upon the breast, and two others behind the ears; cataplasms, composed of rye meal, vinegar and mustard, to the soles of the feet; bathed its whole body with warm brandy—afterwards, with diluted spirits of sal. ammoniac; and, from time to time, we attempted to give it a spoonful of wine whey, but to no purpose, as it was incapable of swallowing. This treatment was pursued for two or three hours: in the beginning it appeared to promise relief; the fits of screaming did not return so frequently; respiration continued a longer time, and the circulation became more vigorous. In about four hours the blisters produced their effect; upon their operation we had great reliance; but they produced no sensible alteration in the state of the disease: the fits still continued to return as in the beginning, and with the same succession of symptoms as above described.

Six hours had now elapsed; the cries of the child became more feeble; respiration was suspended for a greater length of time than in the commencement of the disease, and the circulation became less vigorous: these, with the greater coldness of the extremities, confirmed us in our fears of the event.

Having frequently employed a stimulating bath, prepared with bark and spirits, in the latter stages of malignant fevers, and diseases of great debility, I determined, as a last resource, to give it a trial in the present case. I therefore directed four ounces of powdered Peruvian bark to be boiled for a few minutes, in about two gallons of water; to this, when fit for use, a pint of Jamaica spirits was added: when it was cooled to a temperature rather above that of the body, the child was immersed in it up to its neck; and to render the bath more stimulating, I added, from time to time, a small quantity of the spirits of sal ammoniac.

In a very short time a favourable and very apparent change took place; respiration, while the child remained in the bath, was perfectly restored; the circulation became vigorous and active; the countenance resumed its lively hue; the eyes recovered their natural expression; the power of swallowing returned, and, in every respect, the child manifested symptoms of relief. In this state of things we removed it from the bath, wrapped it in warm dry flannels, and put it to the breast. To the great joy of its mother, it returned to it with eagerness; it remained composed, and free from complaints a considerable time, perhaps for the space of half an hour. At the end of that time, respiration became irregular, and was again interrupted, followed with the same change in the circulation and in the colour of the skin as has already been described. The bath was employed a second time, and with the same relief as before. It now fell into a sleep, remained so for an hour, breathing freely; its circulation regular, and the child, to all appearance, freed from its complaints. At the end of this time, we were again alarmed with the same distressing symptoms of screaming, and interrupted respiration, with which it was first attacked; but the bath as readily relieved it a third time. As far as I can recollect, it had two or three more paroxysms, but they were of shorter duration, returned after long intervals, and were uniformly relieved by the use of the bath. Since that time the child has had no return of the disease, and is at present in perfect health.

CASE II.

IN the month of December, a child of my brother, Doctor Alexander Hosack, was suddenly seized with the same disease, and attended with precisely similar symptoms: it was six weeks old, of good constitution, and had been remarkably healthy. I was immediately called to visit it, and upon entering the room, was

told that I had come too late, and that the child was dying. At this time respiration was completely suspended, the face of a dark blueish colour, the circulation weak, and very irregular, and the extremities were almost cold. I instantly directed a bath to be prepared in the same manner as I had done for Mr. Pendleton's child: in the mean time, the disease underwent nearly the same change and succession of symptoms as were described in the preceding case. When the bath was prepared, the child was immersed in it: in a short time, the respiration became regular: the child was continued in the bath about 15 minutes, but was by no means relaxed, as by the operation of the bath of warm water alone. When it was removed, it appeared to be perfectly relieved, and remained so for the space of twenty minutes, or half an hour; when the fit returned, but was of shorter continuance, and less violent: the bath was employed a second time, which completely removed all complaint. The child is now living, and in good health.

AS to the pathology of this disease, I dare scarcely offer a conjecture, having yet seen but five cases of it: this much, however, appears to me probable, that during the suspension of respiration, the blood ceases to circulate through the lungs, and passes by the former route through the *foramen ovale*. Hence we may account for the dark colour of the countenance, as occurred in the cases of obstruction in the *pulmonary artery* and *canalis arteriosus*, as related by Dr. William Hunter,* in the last volume of the London Medical Observations and Inquiries, which tends to shew the intimate connection between life, and the due oxygenation of the blood, by the process of respiration.

Why respiration should be thus suddenly suspended, becomes a question of importance, as, in the solution of it, the first cause of the disease is probably to be found: all the cases of it which I have seen, except the one last described, have occurred within the month; three of those within the first ten days after birth; and it is, perhaps, of importance to add, that the first three children in whom it proved fatal were of exceedingly delicate constitutions.

Another question relative to this subject occurs to me. What is the nature of the disease which so frequently proves fatal to children born at seven months? May it not proceed more especially from inability in the organs of respiration, by which that function is so readily interrupted, and consequently from a want of a due oxygenation of the blood? The symptoms preceding death are not unlike those I have described, and would appear to warrant the conjecture; but the cause which interrupts respiration in a child born at the full time, and of apparently good constitution, is not so apparent.

* See vol. vi.

ARTICLE VIII.

A CASE SIMILAR TO THOSE WHICH FORM THE SUBJECT OF THE PRECEDING ARTICLE.

By E. H. Smith.

TO increase the scanty sum of information relative to a disease hitherto perhaps not very attentively considered, and imperfectly understood, is my inducement for annexing to Dr. Hosack's paper, the history of a case which is supposed by us both to be of the same kind with the cases related by him. Other practitioners, it is to be hoped, will supply those deficiencies, which, after all, will be no doubt observable both in the pathology and practice.

In the month of September, 1796, I was called to the infant child of Mr. Webb, of this city. The child was not more than nine days old; and had, till that time, been perfectly well. The pressing avocations of Dr. Moore, who was the family physician, obliged him to leave his patient under my sole care. The child had been repeatedly convulsed, before I saw it,—which was about noon—in the course of the day, and had taken laudanum and catmint tea, I believe by the direction of the nurse, without any relief, as the symptoms were afterwards much aggravated—perhaps in consequence. The convulsions recurring, after short intervals, and appearing to increase in violence every time, I ordered the child to be placed, up to the mouth, in warm water; in which it was held till the spasms disappeared, and the colour of the skin became more natural. This was repeated several times, without waiting for the recurrence of the fits; till the little patient grew easier, and I left it. The bowels were now, or had been previously, opened by an injection: so that there remained no reason for attributing any of the subsequent symptoms to irregularity of this sort.

In about an hour I was called back. The convulsions were more violent than before. The child was apparently too far exhausted to give any scream, or utter any sound; but the livor, or dark purple hue, came on about the mouth, thence extending over the face and whole body, and increasing in depth of dye as the spasms and difficulty of respiration increased,—and attended with the motions of the eyes common in convulsive cases. The intervals between the fits were now only of a few minutes; so that, though a change was observable in the colour of the skin, as the,

convulsions grew less violent and the breathing more free, yet the skin did not resume a healthy colour.—I believe that I did not quit the patient for an instant, in more than four hours. In this time it had probably 12 or 14, perhaps 20 of these fits; the skin each time assuming this remarkable appearance, and in the manner above mentioned.—As it was easy to discover, by this change of colour, when the fit was returning, we had a bath of hot-water and ardent spirits at hand, into which the child was immediately placed; and where it was continued till the symptoms mitigated, or intermitted.—At length, on the recurrence of another fit, respiration was completely suspended: and neither pulse, nor motion, was perceivable. The skin, too, which during the whole, was preternaturally cool, now felt cold. In this state she remained, till a servant could run down stairs, procure me a quill, bring it to me, and allow me to prepare it for my purpose. This might be near a minute. Then, I inflated the lungs through one nostril—previously closing the other, and the mouth. This was done repeatedly: imitating natural breathing, by gently pressing the air out, and reinflating the lungs, till regular respiration recommenced.—Similar cessations of breathing, and, as it were, of life, occurred afterwards; and I was obliged to repeat this process several times, at intervals of from 15 to 20 minutes. At length, by persevering in the application of heat to the skin, by means of the bath, and of air to the lungs, in the manner described, the severity of the disease was overcome; the fits grew lighter and lighter, and the intervals longer and longer. The child fell into a natural sleep about sun-set; and the next day had no other complaint than debility; nor was any medicine afterwards administered.

It is important to observe, here, how much the preservation of life, in these cases, will depend on the presence of the physician. The attendants and nurse, of the child in question, were so persuaded of the inutility of all endeavours for its relief, that I am convinced that nothing but my presence and repeated solicitations, and even orders, could have prevailed on them to continue their efforts, or aid me in mine, for its restoration.

WITH respect to the nature of this disease, the result of my reflections on it is, that it must be ranked under the general name of ASTHMA, and with that particular species called *convulsive asthma*, by Dr. Darwin. I agree with Dr. Hosack in attributing the change in the colour of the skin to the deficiency of oxygene in the blood; to which deficiency, no doubt, the disagreeable symptoms are ascribable. But this change, and these symptoms, may take place, as in the case of drowned persons, &c. without supposing any unnatural circulation of the blood through the *foramen ovale*. That no such circulation actually happens, in

these cases, more than in health, [for we all know that this foramen is seldom perfectly closed in early infancy,] appears probable—1. From the sudden access of this disease—2. From its short duration—3. From its cure. For, 1. Were we to suppose any unnatural enlargement of the *foramen ovale*, we must suppose it to be connate; or, if not connate, yet remaining when at any time produced. 2. In this case, the symptoms consequent on such a condition of the heart, must appear from the birth, or continue from the time of the occurrence of this condition. They would not suddenly shew themselves at nine, or ten, or fourteen days, or six weeks after birth, without any apparent cause; and terminate fatally, or be completely obviated, in 24, 12, or perhaps six hours. 3. In this case we should expect, according to Underwood's description, that all the symptoms would be aggravated by motion; but this is not a fact observable in this disease, or if observable, only so in a slight degree. 4. The method of cure is likewise unfriendly to such a supposition. The stimulus of warmth, or alcohol, or ammoniac, or cantharides, to the skin, and of oxygene to the lungs, could have no effect on the structure of the heart. And though it may be said that the blood only passed through the *foramen ovale*, from inability of the lungs to admit its circulating through them, yet, it might be supposed, that having once reverted to its old course, and finding it so easy, it would, on any slight impediment in the lungs, be likely to recur to the *foramen ovale* a second time; and so the disease be a second time produced. But I have heard of no instance of this proving to be the case. It does not appear to have been in the children of Mr. Pendleton and Dr. A. Hosack; and it certainly has not in Mr. Webb's child; which was a fine healthy girl; and has ever since so continued. And I may add, that the same is the fact in relation to his eldest child, which was born in Dublin, where, on the same day from its birth, (the ninth) it suffered in the same way; but was relieved by means not known to me.

I shall dismiss this hasty consideration of the subject, with two suggestions. 1. The probability that the method of cure above described, would frequently succeed in recovering still-born infants. 2. That it may be worth observing whether persons, suffering the disease here treated of, are liable to the asthma in advanced life.

March, 1798.

ARTICLE IX.

An Attempt to accommodate the Disputes among the Chemists concerning Phlogiston. In a Letter from Dr. MITCHILL *to Dr.* PRIESTLEY, *dated 14th Nov. 1797.*

ON reviewing the state of philosophical controversy, as carried on both in Europe and America, between the phlogistians and their opponents, it has of late appeared to me, that much of the difficulty which attends the subject, arises, as in abundance of other cases, from the want of a precise language, and of a right understanding of each other's meaning. This was so evident to me, in the present case, that I informed my audience of it in one of my public lectures in Columbia College; and added my belief, that due attention to terms, their application and use, would have great influence in bringing the dispute to a termination.

Having subjected water heated to the temperature of steam in an eolipyle, and directed the stream issuing from it to the surface of red-hot charcoal, the coal brightened, and a greater flame was observed near the spot against which the steam was made to play. Here was an occurrence opposing the common observation of mankind, that water will always extinguish fire by reason of its own incombustibility. Water, kept at or below a certain temperature, will extinguish fire, and so will oil; but if water be raised to a heat sufficiently high, it will also burn, or undergo decomposition like oil. As far as I could judge from the phenomena before me, water, in proper circumstances, underwent a true combustion, and was inflammable, for the same reason that oil was, because it contained a something that would burn; and this something seemed to be exactly similar to that which made oil capable of exhibiting flame. It struck me instantly, that the inflammability of the vapour proceeding from burning fat, from heated alcohol, from camphor, coal, ether, and a multitude of other substances, gave evidence of their possessing a principle enabling them to burn with flame, after the same manner that water did. If there was this similarity, or indeed identity, of the inflammable radical among them, there appeared to be no more propriety in calling that radical *hydrogene*, than in terming it *olegene*, *alcohologene*, *etherigene*, *coaligene*, &c. To give the radical substance, enabling oil, alcohol, ether, and coal, to burn with flame, a name derived from water, because it enabled water to burn with blaze too, appeared to me partial, illogical, and wrong, inasmuch as it constantly and unnecessarily brought water and its properties to mind,

whenever any thing was thought of that contained hydrogene. And by this unhappy association, besides the difficulty which attends the subject in point of fact, vastly greater difficulty was made to surround it by reason of the ill-chosen and badly assorted terms employed in talking about it.

I had entertained no doubt, for two years, that hydrogene was an improper word for a nomenclature of science, and deserved to be struck out of the list: but as I was engaged in reforming another article of that arrangement, I chose not then to meddle with it. And I am glad I did not; since the prolonged disputes between the parties, afford more weighty causes for an alteration of terms at this day, than existed at any former time.

The circumstance common to all the processes I have mentioned, is "burning with flame or blaze," which, wherever it occurs, seems to indicate the presence of what has been called hydrogene. According to my present conception of the matter, this principle or substance, common to so many bodies, and enabling them to undergo inflammation, may, in strict propriety, be called phlogiston. I always thought phlogiston a well-conceived word, and have objected to it not on account of the impropriety of the term as such, but because of the vague and unsatisfactory way in which it was used. If a definite signification can be affixed to it, I think the adoption of it will be still a great acquisition to philosophical language, and have a tendency to settle at least half the controversy which divides the chemists.

I propose, then, to expunge hydrogene, and substitute *phlogiston* in its place. *Phlogiston* will thus be the radical term, and mean strictly the thing, in combustible bodies, which forms blaze or ignited vapour. The union of this with mere caloric, will make *phlogistous*, or inflammable air; the air which burns with blaze. The combination of phlogiston with oxygene, will constitute water, or *the oxyd of phlogiston*, one of the products of inflammation, and, like fixed air and other compounds, formed during the same process, incombustible in common temperatures and circumstances, afterwards. And the cause of this slowness to burn, of water and the other compounds which combustion furnishes, is owing to the large dose of oxygene with which they are charged, giving them little or no appetite for more. If the base be united to a yet larger quantity of oxygene, it will form the acid of phlogiston, or water soured by excess of oxygene, as, perhaps (though I do not believe it) in what is termed the pyro-lignic and pyro-mucic acids, and perhaps in some other cases; but the readiness with which phlogiston parts with its surplusage of oxygene, turns back to water, and preserves itself in that oxydated form, as proved by the operation of sharp pointed filaments under water, in effecting the separation, shews that Nature, in enabling the principle of inflamma-

bility to combine with oxygene, disqualified the latter, in most cases, from becoming an acid with the former; unless it should be found (and in this I have no faith) that the formation of the native acids of vegetables is a process of this kind. Should this latter conjecture turn out to be the fact, there would be instances enough of *phlogistic* and *phlogistous acids*.

On the decomposition of fat and oil by fire, it is known that a large quantity of water is formed, and this, probably, by an union of the base of vital air with phlogiston or hydrogene. The like obtains in the inflammation of alcohol, ether and coal, the phlogiston or hydrogene of which apparently turns to water, by junction with oxygene. And the principle, which, in the first instance, readily exhibits the blazing appearance, is changed, by and during that operation, to a something much more difficult to inflame, by any after-process.

If hydrogene, or phlogiston, is the material which inflames in the substances already mentioned, there is presumptive evidence, upon the face of the subject, of its existence, also, in the common sulphur, phosphorus, zinc, and iron, of the laboratories. I do not mean to say it is a *necessarily* constituent part of either of those bodies, for I believe they may exist without it, or at least, they may be conceived to exist abstractedly from it. They therefore stand very well in the nomenclature as simple substances. But if these substances, such as we commonly get them after exposure to the common atmosphere in ordinary temperatures, are taken for simple or pure elementary bodies, the persons who consider them so, fall into a great mistake. In their usual forms they are all incorporated with hydrogene or phlogiston, and from it derive their capacity to burn with flame. This will be the more clearly seen by considering them more particularly one by one.

Of Sulphur.

1. The phlogistians say, sulphur is composed of phlogiston united to vitriolic acid; consequently, if any thing takes away that ingredient from the acid, this will turn to brimstone. The antiphlogistians affirm sulphur to be a simple body, uncombined chemically with any thing; and that it becomes sulphuric acid by junction with oxygene. Now, both parties have reasoned in a manner that does not by any means satisfy me. They have viewed the combustion of sulphur in the abstract, rather than taken it up as it is. The fact is, that the acid formed in the combustion of sulphur, is not the solid crystallized matter, or the glacial oil of vitriol, but a solution of these crystals in water. The existence of vitriolic acid in a fluid form, implies necessarily the co-existence of water. The formation of the water in the inflammation of sul-

phur, appears to have been passed over by both parties; though the interpretation of this part of the process seems to me to furnish the means of reconcilement. Thus, while the pure sulphur combines with one portion of oxygene to make the acid, the hydrogene, or phlogiston, unites with another parcel of it to form the water in which the acid dissolves. Common brimstone, then, is not a simple substance, but is a *phlogisture of sulphur*. And this is confirmed by the fact, that where combustion is restrained, the sulphur may be resolved into hepatic gas; the phlogiston turning with caloric into inflammable air, and dissolving some of the sulphur. The formation of common hepatic gas seems to evince the same thing; for while the pot-ash seizes the sulphur, the hydrogene, or phlogiston, is set loose, turns with caloric to hepatic gas, and snatches, as it departs, a portion of the sulphur from the alkali. Thus it appears that the two systems are reconcilable with each other. When the old chemists talk of phlogiston, they should define it to be that thing which burns with flame, and, when united to oxygene, forms water. When the new ones make experiments on sulphur, they should remember that the common material called by that name, is not the abstract, pure, uncombined, elementary thing they intend in their nomenclature.

Of Phosphorus.

2. In like manner the phenomena attending the inflammation of phosphorus seem to have been as negligently interpreted. Phlogiston, added to phosphoric acid, was said by some to constitute phosphorus; while oxygene, added to phosphorus, made phosphoric acid, in the opinion of others: but these were a kind of chemical theorems, true only in the abstract. Experimenters find that phosphorus burns *with flame*, and *water* is exhibited during the process. All that needs be said about it is, that in common circumstances phosphorus, though capable of existing per se, has a very strong attraction for hydrogene or phlogiston, and, in ordinary cases, attaches more or less of it to itself. During its inflammation, a part of the oxygene, as in the case of the sulphur, combines with the phlogiston into water, and another part of it joins the oxygene, to constitute the acid. In estimating the *whole* of the process, the candid partizans of both sides will allow, that the substance under consideration parts with its phlogiston, and borrows oxygene; and thus water, and the acid dissolved in it, are formed.

Where is the harm of owning that common phosphorus contains a portion of hydrogene united with it? It does not invalidate the modern theory, but it shews that the objections of the ancient doctrine were not frivolous, as they have, by some, been

deemed to be; but, on the contrary, very substantial, and not capable of reconcilement, upon any other plan that I know, than the one herein suggested.

Of Zinc.

3. Zinc may be abstractedly considered as a simple body; and with propriety placed as such in the catalogue. Commonly, however, it is presented to us in close connection with hydrogene, for which its attraction is so strong that they commonly appear in the form of a *phlogisture of zinc*. When that composition is employed for experiments, it is very easy to conceive how, when such zinc is exposed to a sufficient heat in an open fire, the phlogiston dislodged, and immediately becoming phlogistous gas, or inflammable air, shall take upon itself the form of flame, and constitute water; while the oxygene combines with the metal into a white oxyde, the flowers of zinc. So, if the same compound be dissolved in sulphuric acid, the phlogiston displaced will turn to inflammable air, while the acid and the zinc form white vitriol. In this way some of the phlogistous or inflammable gas may be accounted for, as extricated from the metallic preparation; and, at the same time, I see no objection to deriving the rest of the great quantity afforded by this process, from the decomposition of part of the water or oxyd of phlogiston. To accommodate matters then, the advocates of the Lavoisierian theory should concede that zinc, in common circumstances, is associated with hydrogene or phlogiston. And the disciples of Stahl should, on their side, allow, that zinc cannot be considered as a pure metal, while alloyed or blended with phlogiston, or any other foreign ingredient. The material they have all worked upon is not the uncombined metal, but a phlogisture of zinc.

Of Iron.

4. Some sorts of iron treated by heat alone, afford phlogistous or inflammable air. The same metal may be made to burn with flame; and when treated with sulphuric acid, it affords much phlogistous air. What, then, is the thing commonly called iron? Is it a pure and unmixed substance? Or is it a compound of elementary iron with hydrogene or phlogiston? The facts enumerated lead conclusively to the latter opinion. The phlogistians are right, then, when they say common iron is a compound; and they are right when they say the inflammable air obtained from it is nearly pure phlogiston. And the antiphlogistians are justifiable in placing in their enumeration of simple bodies, such a thing as elementary

iron is or may be imagined to be; and in ascribing the production of hydrogenous or phlogistic gas to a decomposition of part of the water. The compound called iron, then, gives out something, and takes in something, in all the common processes. And the modern chemists should correct the mistake they appear generally to have fallen into, of taking it for granted, that that was a simple substance which in fact is a chemical composition of iron with hydrogene. And thus finery cinder, which evidently differs from hematites, or any pure oxyd of iron, may be a triple compound of iron, hydrogene, and oxygene, which just about corresponds with your idea, that it consists of iron and water.

It will not follow from all this, that because phlogiston or hydrogene so generally exists in combination with zinc and iron, that it must be an ingredient in all metals. For gold, arsenic, silver, platina, mercury, copper, tin, lead, bismuth, cobalt, antimony, manganese, are capable of existing without it, and accordingly do not commonly burn with flame, nor afford inflammable air by solution in acids; though, if ever they exhibit in any of their states, blaze by burning, or phlogistous air with acids, this will only evince the existence of hydrogene in them in such cases. Both parties may thus allow, that some metals contain phlogiston, and some do not.

Nor will charcoal, as has sometimes happened, be confounded with phlogiston, according to this view of the matter, though hydrogene is often blended with it. If coal, at any time, affords inflammable air, this is no evidence of the conversion of that substance into phlogistous gas, but merely a proof that the coal, when submitted to experiment, was combined with the basis of inflammable air, which it could part with and still remain coal; though, in that case, incapable of burning with flame: but in a sufficient exposure to heat and oxygenous air, taking on, without blaze, the form of carbonic acid gas. It may be conceded, then, on both sides, that though phlogiston or hydrogene may exist with coal, nevertheless coal can exist without phlogiston.

I know not how these things may impress your mind. They appear to me to go a good way towards reconciling the existing differences. If, however, I have in this deceived myself, I have only to appeal to your experience and candour. But at present I cannot help thinking that a part, at least, of the controversy between Mr. Kirwan and the French philosophers, as well as that between yourself and Messrs. Adet and Maclean, may thus be resolved. Nor do I see any thing in Mrs. Fulhame's experiments, which renders the accommodation more difficult.

Your opposition to the new doctrine has been serviceable to the cause of science. It has prevented too easy and sudden an acquiescence in the novel system of the antiphlogistians, whose difficul-

ties and paradoxes had been admitted by many, without having been subjected to due examination. You have prompted more vigorous inquiry into these matters than would probably otherwise have been made; at least, for myself, I acknowledge your views of things have induced me to examine the points under discussion, with much more attention than I should otherwise have done. Perhaps even now my labours are but of little avail; or, if they were capable of bringing about a coalition of parties, I might say to you, after all, in the words of Prior in his Alma:

For, Dick, if we could reconcile
Old Aristotle with Gassendus,
How many would admire our toil!
And yet how few would comprehend us!

I am, with many wishes for your happiness, and thanks for the publications you have from time to time favoured me with, sincerely yours,

SAMUEL L. MITCHILL.

ARTICLE X.

A Letter to Dr. MITCHILL, *in reply to the preceding, by* JOSEPH PRIESTLEY, LL. D. *&c.*

DEAR SIR,

I Thank you for your ingenious, and well intended, attempt to promote a peace between the present belligerent powers in chemistry; but I much fear your labour will be in vain. In my opinion there can be no compromise of the two systems. Metals are either necessarily simple or necessarily compound; and water is either resolvable into two kinds of air, or it is not.

Your argument to prove that it is, I do not think conclusive. A current of steam is accompanied with a current of *air*, which increases the fire; but cover the hot coal with steam, and it will be extinguished as soon as if it were dipped in cold water. The steam only supplies a basis for the air into which the coal is resolvable, carrying away both the phlogiston and the heat: whereas the vapour of oil is real fuel. When sent through a red hot earthen tube, it is converted into inflammable air; but water, treated in the same manner, is water still.

My father-in-law, who was an iron-master, was deceived by the experiment of the eolipyle, and thought to save the usual expence of bellows to his furnace, by mounting a large one over it; but, after incurring much expence, this instrument soon extinguished his fire.

As to *metals*, all the calces of all of them that I tried, even that of mercury, imbibed great quantities of inflammable air when they were revived; so that I cannot but conclude that phlogiston is an essential ingredient in their composition.

Till the antiphlogistians can produce more unexceptionable evidence of the composition and decomposition of water, and shew that *finery cinder*, which they call *oxyde of iron*, really contains *oxygene*, the old doctrine will keep its ground; and, as I am well persuaded they cannot do this, I have no doubt but that, in a reasonable time, it will recover the ground it has lost, and be more firmly established than ever.

As I presume you are acquainted with Dr. Maclean, I shall be obliged to you if you will inform me when he replies to my last pamphlet. He did not treat me with the civility to which I think I am entitled as a veteran in the science. Had he been the victo-

nious Buonaparte, I am old Wurmser, and should have been treated with respect, though vanquished. But this Mantua has not surrendered yet.

I shall be very happy to hear from you again, and am, with much respect,

Dear Sir,
Yours sincerely,
J. PRIESTLEY.

Northumberland, January 18, 1798.

P. S. Dr. Maclean did not, as the laws of war require, ever send me a copy of his pamphlet; and as I never saw it advertised, it was only by the accident of my son's being in Philadelphia that I got it.

ARTICLE XI.

Some Account of the Epidemics which have occurred in the Town of BETHLEM, *Connecticut; from its Settlement to the present Time. Extracted from a Letter to Mr. Smith,*

By the Rev. AZEL BACKUS.

YOU have probably heard that the clergy of this State, in General Association, have agreed to keep an accurate bill of mortality, beginning January 1st, 1798, in their respective parishes and towns, comprehending age and disease. When the General Association meets in 1799, the public will be favoured with a bill of mortality, for the whole State of Connecticut, and so on yearly. This can be done with little trouble by our profession, and as it is understood that we keep a bill not only for our particular people, but of those of different denominations that happen to fall within our local precincts, it probably will be quite accurate. If I can throw in my mite for the physical happiness of mankind, I will cheerfully do it. To this end, I will give you a history of this place from its first settlement, as I have learnt it from the records of my predecessor, and the authentic information of the aged.

Bethlem lies south of Lichfield; and is between four and five miles square. Like the rest of Lichfield county, it is ridged into hills running due north and south. This little town contains in its territory, six of these undulations of hills, and between each undulation there is a perrenial stream of water. The soil is very fertile, and at present very much cleared of its native wood. When the late census was taken it contained 1500 inhabitants. The settlement of the town began in 1730. The Rev. Joseph Bellamy was ordained their minister in 1740, there being then but 14 families. The popularity of their minister soon drew many other families from various parts; the forests fell; and it became a religious, a happy, a healthy, and prosperous community. In the year 1748, an individual built a dam across the central valley of the town, in order to kill the timber of a flat in the north part, containing about 50 acres. In this swamp, producing little vegetation, save black alders and poison sumach, a pond stood till the spring of 1750; when it was let out, and, with its stream, the pestilence issued, which carried off between thirty and forty of the most hale and robust inhabitants. Doctor Bellamy, in his records, says it was a nervous, long, but very malignant fever, and that the well were not sufficient to tend the sick. The old people tell me

that the neighbouring physicians called it the plague. Doctor Seth Bird informs me, that the symptoms of the diseased were a wire pulse, coma in a few hours after being taken, loss of reason, and most generally the loss of speech for twenty days in those that recovered; sores, the bigness of a dollar, on various parts of the body. ——— ——— ———, whom you know, was supposed to be saved by pouring boiling liniment into these mortification sores on his body. The length of so malignant a disease, says the doctor, was something I could not reduce to theory; the faculty generally pronounced it sui generis.

As few of the physicians, and still fewer of the people, thought the ponded swamp the cause of the disease, ten years after what the old people call the first great sickness, the same low ground was again overflowed. After the letting out the water in 1760, another wasting sickness began in the month of November, and carried off about 40 inhabitants: this was called a malignant pleurisy. The sick generally died the fourth or fifth day; some in 24 hours. The whole town was afflicted with a hard influenza. It was in this sickness, that the story of the quails originated, which you have probably heard. A man of undoubted veracity was approaching a house in which five of the diseased lay, and saw a flock of quails fly over the chimney; five of the quails fell dead, which were, on the same day, seen by many persons still living, and by the credulous it was thought ominous; but of the fact there is no room to doubt. There is also a circumstance respecting this last disease a little peculiar and different from general theory. By the record of mortality it appears to have raged the most in the beginning of December. If you wish for more facts than what is contained in this outline, you will please to apply to Doctor Bird.

Very general health was enjoyed in this place, from 1761 to 1789, when the influenza had an universal run; in 1791, it was repeated with still greater severity. This could not be attributed to the old box of Pandora, the pond, which, for these twenty years, has been drained and reduced to a meadow. In 1792, we had five deaths among children, by the cynanche trachealis, vulgarly called bladder in the throat. In August of this year (that is 1792), there were seven or eight instances of the scarlatina, but not mortal. In February, 1793, the angina maligna attacked our healthiest children like an armed man. Nineteen, from the age of four to 20, fell victims to it in three months, but far the greater part of these in the month of March. The number who were sick with it I cannot tell. It was more or less in almost every family, and few of the children escaped a slight touch of it. The disease had every grade, from the slightest indisposition, up to dying in 12 and 20 hours from

the time they were seized. From the first of May it began gradually to decrease, until it totally disappeared in November.

On the 10th of January, 1794, the angina maligna, or canker rash, reappeared: between this and the 20th of May following, we lost 13 under 20 years of age, and one aged 25. Many who now had the disorder, had had it in 1793. It was not so generally prevalent as before, but quite as malignant. There was no instance where the disease terminated in swellings about the throat, but they recovered. Many of the instances where death ensued, seemed in the outset to bid defiance to medical skill. Life seemed to rush away *qua data porta*, and to mock at medicine.

If you wish for a more circumstantial account, you must inquire of our acting physicians. We have no certain evidence that it was contagious; but several instances of the disease in families where there had been no communication with the sick. I would observe, however, as I was often among it, I twice or three times had the sore throat, and had my tongue striped with it; and often felt sensations, while in rooms with the sick, like the slight stinging of bees about the passages of the throat. Something more than could be attributed to sympathy, or the powers of imagination.

ARTICLE XII.

SOME ACCOUNT OF THE COUNTRY AND CLIMATE OF THE NORTH-WESTERN LAKES.

By Major C. SWAN, *Paymaster to the Western Army.*

NOTE. *The following Article consists of Extracts from a Letter of Major* SWAN, *to Capt.* FRYE, *Commandant of the Garrison at Governor's Island, who was so obliging as to communicate them to one of the Editors; and they are now made public with the consent of the Author. These Extracts are briefly made from a Journal kept by Major* SWAN, *at the time; and are inserted for the threefold purpose of illustrating the table of thermometrical observations which follow, of communicating a short, but authentic view of a part of the North-Western Territory, and of inviting further information.*

D'Etroit, October 10, 1797.

* * * \

Michilimackinac, but even into Lake Superior; and returned to this place, on the 4th of last month, highly gratified indeed.

"We first left this place, and traversed Lake Sinclair, a handsome circular lake, about twenty-five mile across. We then proceeded up the river of that name, which is broad and very handsome, for about forty miles, to a rapid at the entrance of Lake Huron; traversed this immense, beautiful lake, three hundred miles long; and arrived, on the 15th of August, at the streight which unites it to Lake Michigan. This streight is broad; and the Isle de Bois Blanc, or white-wood island, Round Island, and Michilimackinac Island, form a cluster in the middle of the streight, and afford a romantic and majestic landscape from the sea. The Isle de Bois Blanc is eleven miles and an half long, and from two to three wide, lying parallel to the two coasts of the streight, but nearest to the south side. Round Island is about three miles in circumference, and lies at the upper or south-west end of De Bois Blanc. The island of Michilimackinac is circular, and lies between the upper end of De Bois Blanc and the north-western coast of the streight; having a channel of about one mile and an half between it and De Bois Blanc, and a channel of nine miles between it and the north-western coast of the streight. It measures seven miles and three quarters in circumference, and is nearly circular. On the south side of this island, there is a small bason, of a segment of a circle, serving as an excellent harbour for vessels of any burden, and for canoes. Around this bason the village is built, having two streets of nearly a quarter of a mile in length, a Roman chapel, and containing eighty-nine houses and stores; some of them spacious and handsome, with white lime plaistering in front, which shews to great advantage from the sea. At one end, and in the rear of the town, is an elegant government-house, of immense size, and finished with great taste. It is in the form of ||⌔||; one story high, the rooms fifteen feet and an half in the clear. It has a spacious garden in front, laid out with taste; and extending from the house, on a gentle declivity, to the water's edge. There are two natural limpid springs in the rear of the house, and a very lively grove of sugar-trees, called the park. Suitable out-houses, stables, and offices are added; and it is enriched on three sides, with beautiful distant prospects. Twenty rods from the rear, there is a sudden and almost perpendicular ascent of about a hundred feet of rock, upon the top of which stands the fort, built of stone and lime, with towers, bastions, &c. occupied by our troops, and commanded by Major Burbeck. About half a mile from the fort, in the rear, there is an eminence, which I estimate to be about two hundred and fifty feet from the surface of the water. This spot commands an extensive and sublime view of the adjacent country. The fort, the village, the

neighbouring islands, and channels, seem prostrated at your feet; while, to the south-west, you look into the immensity of Lake Michigan, which looses itself in the southern hemisphere; and, to the north-west, the great Lake Huron lies expanded to the bounds of the horizon. It was a beautiful morning when I had this view.

" This celebrated streight is the only key to the immense, lucrative skin-trade, now solely carried on by British subjects, from Montreal, with the nations of Indians called the Sauteurs or Chipewas, Sioux, Reynards, &c. who inhabit the water-courses that fall into the Mississippi between the Illinois and the Falls of St. Anthony. Canoes are loaded and fitted out by these traders every year, from Michilimackinac. They commonly set out in July, and return in June, July, or August, the year following, to Michilimackinac, from whence they started. Here they are again met by the Montreal canoes, with fresh goods, exchange loading, and each return from whence they came. The Montreal canoes penetrate to Michilimackinac, by way of Grand River; which, with the exception of a small portage, conveys them to the northern point of Lake Huron; and return by the same route. Those from Michilimackinac penetrate the interior or Indian country, by way of Green Bay, an arm of Lake Michigan; thence, through Fox River, into the Mississippi and its tributary streams; and return also to Michilimackinac by the same route.

" On the 22d of August we left Michilimackinac, and on the 23d anchored in the streight of St. Joseph, which leads to Lake Superior. At this place Nature has displayed very handsomely again. The mouth of the streight is about thirty miles wide, but so strewed over with innumerable small circular islands, that it is difficult to obtain a view in any direction of more than six or eight miles. Indians have sometimes been lost among these islands, for weeks together. They extend into Lake Huron, and continue along the north-west coast of the lake for an hundred and eighty miles, and are called, by the savages, the Meneto, or Devil's islands. From the entrance of the streight, at a place called the *Detour*, it is nine miles to the new British garrison, built on the point of the island of St. Joseph, commonly called the Carraboo island. This is the largest in the streight; being about twenty-five miles long, and from ten to three broad.

" On the 23d of August, we left the vessel, embarked in three canoes, ascended the streight in what is called the canoe channel, and encamped at Muskito Point.

" The 24th, at one o'clock P. M. we arrived at the Falls of St. Marie, called *le saut de St. Marie*. These falls are about three quarters of a mile long, and half a mile wide; the rapid not violent; and the perpendicular of the whole fall about thirty feet.

There is a small kind of village on the United States' side, containing sundry large ware-houses, and a few decent dwelling-houses, occupied by the Agents of the Canada North-west Trading Company. There is not a clear white-woman in the place.

* * * * * * * * * * * "The 25th it rained. * * * * * * * * * * * * "On the 26th we set off, in two bark canoes, from the upper end of the portage, for Lake Superior. * * * * At one o'clock P. M. we entered Lake Superior; looked fairly into it; drank of its waters; ate our dinner; and put about, with a fine fair wind. We reached the falls again at four o'clock in the afternoon; placed experienced guides, with strong paddles, in the bow and stern of each canoe; hoisted the fifteen stripes; and launched into the bosom of the cataract. In a moment, we were safe in the bason at the bottom of the falls!

"We embarked early on the 27th. Having a strong current and fair wind, we descended in the ship channel, and reached the vessel, at Carraboo Island, at nine o'clock in the evening.

"The 28th, we put to sea again; and on the 4th of September, at sun-down, reached this place.

"I inclose to you, herewith, degrees of heat which were ascertained by regular observation with Fahrenheit's Thermometer, every day; by which you will perceive that the temperature of the Lakes differs widely from that of the Atlantic country."

On comparing the Table of Observations, which is annexed, with observations made on the same days in this city, the difference will appear so remarkable, that the reader may suspect some error in the instrument made use of by Major SWAN: and such were my suspicions. But, crossing the East River, to Governor's Island, in company with that gentleman, on the 4th of March, 1798, he observed that the wind, which we then felt, and which was very brisk, resembled, in point of temperature, that which he experienced on Lake Huron on the 14th and 15th of August, 1797; and added, that on the same evening, a frost affected the gardens at Michilimackinac so severely as to destroy the greater part of the vegetables.

E. H. S.

TABLE

Of the Degrees of Heat observed on FAHRENHEIT'*s Thermometer, from August 4th to September 4th*, 1797.

1797.	6 o'clock A. M.	12 o'clock M.	7 o'clock P. M.	Average	REMARKS, where.
Aug. 4.	66	63½	59	62¼	Lake Sinclair.
5.	59	66	63½	62¼	Do.
6.	55½	65	66	62	River Sinclair.
7.	60	67	67	64	Do.
8.	59	61	61	60	Do.
9.	57	62	52	57	Do.
10.	58	62	61	60	Do.
11.	63	59½	60	60	Lake Huron.
12.	57	60	61	59	Do.
13.	55	55½	55	55	Do.
14.	50	49	47	48	Do.
15.	45	66	54	55	Michilimackinac.
16.	52	70	53	58	Do.
17.	54	69	60	61	Do.
18.	52	67	62	60	Do.
19.	54	64	56	58	Do.
20.	53	64	58	58	Do.
21.	62	63	63	62	Do.
22.	54	61	59	58	Streights of St. Joseph.
23.	57	65	60½	62	Do.
24.	50	63	60½	57	Do.
25.	46	53	49	49	Falls of St. Marie.
26.	46	49	50	48	Lake Superior.
27	50	56	49	51	Streights of St. Joseph.
28.	40	50	46	45	Lake Huron.
29.	51	54	57	54	Do.
30.	49	57	53	53	Do.
31.	50	56	49	51	Do.
Sept. 1.	48	57	47	50	Do.
2.	51	59	50	53	Do.
3.	49	58	50	52	River Sinclair.
4.	48	56	49	51	Lake Sinclair.

REVIEW.

ART. I. *A View of the Science of Life; on the Principles established in the Elements of Medicine of the late celebrated John Brown, M. D. with an Attempt to correct some important Errors of that Work. And Cases in Illustration, chiefly selected from the Records of their Practice, at the General Hospital at Calcutta.* By *William Yates* and *Charles Maclean. To which is subjoined, a Treatise on the Action of Mercury upon Living Bodies, and its Application for the Cure of Diseases of Indirect Debility. And a Dissertation on the Source of Epidemic and Pestilential Diseases; in which it is attempted to prove, by a numerous Induction of Facts, that they never arise from Contagion, but are always produced by certain States, or certain Vicissitudes of the Atmosphere.* By *Charles Maclean*, of Calcutta. Philadelphia. *Young.* 1797. 8vo. pp. 232.

IN considering the present imperfect state of Medicine, it must be matter of regret, that so much yet remains to be done in the establishment of general principles. This desirable work has not only been retarded by the intrinsic difficulties of the subject, and the want of exertion among physicians; but it has also been degraded by the many frivolous and visionary speculations, which every where abound in books of medicine. If theory, however, be restricted to the legitimate deductions of reasoning, grounded upon facts, corrected or confirmed by the results of sound experience, it will not be easy to prove it to be either pernicious or useless. To inveigh against theory, is the common subterfuge of indolence, ignorance, and the sinister pretensions of empiricism. It is impossible, without some degree of indignation, to hear physicians asserting that an animal body, unlike other parts of nature, is governed by no regular and immutable laws; that medicine is merely a conjectural art; that it can boast of no definite or established principles; and that professional ability depends on some rare, intuitive, incomprehensible felicities of mental character, not reducible to principles, nor capable of being taught to others. Such assertions are not only derogatory to the profession; but they are destitute of truth. And, perhaps, it would be impossible to express this in stronger terms than those adopted by the author of Zoonomia, who remarks, that "there are some modern "practitioners who declaim against medical theory in general, not "considering that to think is to theorize; and that no one can

" direct a method of cure to a person labouring under disease with-
" out thinking, that is, without theorizing; and happy, therefore, is
" the patient, whose physician possesses the best theory."

The authors of the work before us, devote the first part to the establishment of the principles which are to guide all their subsequent reasoning and practice. In doing this, they generally follow the fundamental doctrines of the Brunonian system. The light they throw on many parts of that system, and the zeal they display still further to improve as well as to commend it to public attention, reflect much credit on their ingenuity and diligence.

It would not consist with our limits on this occasion, to attempt a *critique* on the Brunonian theory. As its reputation, considered as a whole, is certainly on the decline, we are as anxious to do justice to its merits as to censure its faults. The praise of an original, profound, and luminous understanding, undoubtedly belongs to Dr. Brown. It gives us pleasure to find his name enrolled in the catalogue of those illustrious men, who have extended the landmarks of medical science, and committed the memory of their labours and discoveries to the gratitude of posterity. We remember, with regret, the adversity which clouded the best of his life, and repressed the noble elevation of his mind; and we draw a veil over the frailties that so greatly impaired the force and shortened the duration of his wonderful faculties.

But as the attempt, in the work before us, to revive the popularity of the Brunonian principles, may possibly fall into the hands of some not prepared to detect the mischief which lies concealed under a specious exterior; it may not be improper to make a few remarks, by way of caution. We pass over in silence, the objections to Dr. Brown's system, arising from his hypothesis of a fixed original stock of excitability, uniformly and equally distributed over the whole system, in diseases as well as in health; his doctrine of uniformity in the operation of stimulants; his inattention to the great range of the operations of the absorbent system; and his neglect of the sympathetic associations in the animal economy, which are of such importance in explaining many intricate phenomena, both of health and diseases. These mistakes and imperfections, however defective they may render his system, cannot be supposed to lead to much practical mischief.

Although our authors adopt the fundamental principles of Dr. Brown, they dissent from him in some particulars. The principal deviations are the following. 1. They contend that diseases of excessive excitement cannot exist; and that all those, which have been so called, are diseases of indirect debility. 2. They maintain that almost the whole of the diseases which were ranked, by Dr. Brown and his followers, among the diseases of direct debility, are diseases of indirect debility. 3. They also differ from

him in the mode of applying the exciting powers, for the cure of diseases of indirect debility. Presuming that our readers are well acquainted with Dr. Brown's Elements, we deem it unnecessary to specify his doctrine concerning these topics.

Passing over many points of smaller consequence, we cannot dispense with the duty of remarking on one leading principle in Dr. Brown, adopted and greatly extended by the authors of this work. In treating diseases of indirect debility, they state, that "As the "body becomes less susceptible of impression, in the direct ratio of "the excessive application of stimuli, it follows, that the force of "stimulus to be applied, in the cure of diseases of this state, should "be directly as the exhaustion of the excitability."—Taken in a general and unqualified sense, this proposition is liable to the most pernicious abuses; and when we observe the catalogue of diseases assigned to this class of indirect debility, our attention is still more forcibly arrested. Whatever mischief may have arisen from the application of Brunonian principles to practice, we are persuaded a large proportion of it has sprung from this source. If the animal system were a more simple, homogeneous mass of matter, endowed with excitability uniformly diffused over the whole, incapable of partial accumulation or exhaustion; and if the excitement resulting from the application of stimulants were consequently equal and uniform throughout the entire system; this principle would have a good foundation. But the reverse of all this is found to be true. The animal body is a compound, heterogeneous and dissimilar fabric, made up of very diversified organization, possessing excitability capable of great accumulation, and, consequently, of great excitement in one or more parts, while others are left in a state of proportionate debility from exhaustion. Violent stimulants applied to one part will excite morbid action in that part; and, at the same time, extend this morbid influence to other parts with which it is connected by sympathetic association of motions. The source of excitability (supposing the brain, with its appendages, to constitute this source), irritated by such excessive stimulation, sends forth a larger quantity of this vital power, which, being chiefly transmitted to the morbid parts of the system, renders the action of such parts more violent, until often, through the medium of inflammation and its consequences, the affected organ is rendered unfit for the purposes of life. Here, then, is a complicated disease, whose nature and treatment cannot be decided upon first impressions. If powerful stimuli be applied, to relieve the indirect debility which pervades so large a portion of the system, the primary and principal seats of disease, overwhelmed by such pressure of excitement, will suffer a fatal congestion, effusion, engorgement, extravasation, or gangrene. To restore the balance of the systems, and to guard those parts from injury, which are

exposed to the principal stress of the disease, is the object to be held in view; but this object, we apprehend, will not often be accomplished by powerful stimulants. Life is maintained, and the functions of the system regulated, by the successive supplies of excitability being equal to its waste or expenditure in the perpetual operations of the vascular organization. The remedy provided by nature, for the increased excitement of any part of the system, is the consequent expenditure of excitability. Excessive action, if it can be safely supported for the requisite time, and in requisite degree, will gradually wear away the superabundant irritability, and in this manner bring down the system, and leave it at the point of health. But how many fatal occurrences may take place in the course of this natural process! Provision is made by nature, for sending a very large quantity of blood to the brain, in order, probably, to secrete the matter of life, which is incessantly consumed by every moving point in the body. A small variation of this quantity, by excess or diminution, is, on good ground, supposed to be extremely hazardous. This delicate, vital secretion may be readily overwhelmed by congestion, engorgement, or effusion; modes in which it is probable arterial violence often proves fatal in fevers, and which are indicated by the different degrees of comatose affection, so frequently observed in unfortunate cases. But if the fountain of life should escape, the same event may easily be produced by the congestion, inflammation, and effusion, incidental to other viscera from this vascular tumult. In a word, it appears probable that fevers scarcely ever prove fatal, except where local destruction is in some such manner produced; which, with prudent practitioners, will always be an objection to powerful stimulants in cases of too great arterial force.

Drunkenness affords a familiar example of what Dr. Brown calls indirect debility, or excessive expenditure of excitability. It may serve as an epitome of a malignant fever. Like such a fever, it is owing to a violent stimulus, which produces more energetic motions of the arterial, venous, glandular, and absorbent systems, great prostration of strength in the voluntary motions, staggering, stammering, delirium, apoplectic stupor, and finally great expenditure of excitability, from which the inebriate only gradually recovers, after many hours. Nothing but a more deeply-rooted and virulent cause, and a more protracted disease, are wanting to render the resemblance complete. And yet, we believe, it has been seldom proposed to relieve the indirect debility of drunkenness, by strong stimulants, while any part of the system continues to be considerably excited. Quiet, repose, dilution, cool air, and, in some cases, cold water applied to the surface of the body, have been supposed to be the best remedies. But in such a case,

the necessity of exercising caution in the use of stimulants is not so evident as in regard to the fevers called malignant, and many other diseases of indirect debility. The operation of ardent liquors is generally transient, and rarely endangers the organic derangement of the vascular system, upon which the fatality of fevers often depends. It is indeed, true, that when a fit of intoxication is over, to relieve the languor which always more or less ensues, recurrence is often had to spirituous drink, and that for a time it answers the purpose. But here, before the repetition of the draught, the violent commotion of the system has subsided, and a universal torpor taken place. An illustration of our opinion, similar to this afforded by drunkenness, may be derived from violent exercise or labour, from excessive repletion, from the tumult of anger, &c. In all these cases, we conceive, inordinate excitement should as much as possible be restrained, and every movement brought down to a calm and natural state. The evident injurious effects of ardent liquors, when taken to support the strength of such as are addicted to hard labour; and the experience of Europeans in hot climates, that far greater exertions can be made by persons who chiefly eat vegetables and drink water, than by those who live more freely, appear to confirm our opinion.

The vital power or excitability in animals is an *unique* in nature. On this account, it has been difficult to call in the aid of analogy to explain the intricacies which envelope the subject. The term excitability, given, by Dr. Brown, to this principle of life, has led, we believe, to a number of mistaken views. It appears inherently to possess a great degree of activity, velocity, and vigour. The name he has thought proper to bestow on it, and the impression he gives of life as a forced state, have made this principle be considered as naturally more passive and dormant, when unexcited by stimuli, than a correct examination of facts will warrant. It is indeed admitted, that the presence and application of certain substances, which may perhaps more properly be called *nutritive* than *stimulant*, are essentially necessary to the existence and activity of this principle of animation; just as oil is necessary to preserve the flame of the lamp, or oxygene to support the process of combustion. Animals are constantly immersed in the fluids of heat, of the atmosphere, or of water; and alimentary matters are frequently necessary to repair the waste which the actions of life are continually making. But if a few articles of nutriment or sustenance, such as these, be granted, which are of the first necessity, the principle of life will exert a preserving, resisting, and recovering power; and the functions of the system will proceed with a degree of force and regularity, greater or less, according to existing circumstances. These observations are made with the view of inferring, that when the body is attacked by a morbid stimulus, if the excitement can

be reduced within certain moderate bounds, the inherent powers of the vital principle will soon be sufficient to restore good health.

We now proceed to consider another doctrine maintained in this work, the establishment of which is laboured with great zeal, viz. "That diseases of excessive excitement cannot exist; and "that all those which have been so called, are diseases of indirect "debility." This proposition has so much the air of paradox, that many will suppose a serious refutation of it ought not to be attempted. It is wonderful, that such a fallacy as this should so far impose on the minds of our respectable authors, as to induce them to deny that phrenitis, pneumony, acute rheumatism, small-pox, measles, &c. are diseases of excessive excitement, or that they should be treated otherwise than by stimulants. They suppose this to be proved by the powers known to induce those diseases, and by the remedies found most successful in their cure. The three former of the diseases just mentioned, they believe to be commonly occasioned by the alternation of cold and heat; and, as a high degree of heat, succeeding the exposure of the body to a low degree of cold, will rapidly expend the excitability, they contend that great exhaustion must necessarily take place: but they forget that this morbid exhaustion is produced through the medium of morbid or excessive excitement, and that this excessive excitement, in its turn, will occasion, for some time at least, the production of an excessive quantity of excitability, thereby mutually increasing each other. The "most successful mode of treatment of these diseases, viz. by warmth, small quantities of opium, wine, &c. and by the application of fomentations, rubefaciants, and blisters, to the local affection," they suppose, confirms their doctrine. For the credit of the profession, and the safety of mankind, we hope this treatment is seldom employed. "The languor, inabi-"lity to move, want of appetite, nausea, costiveness, &c. which "occur in these diseases," are supposed by our authors, "to be "evidently incompatible with such a state as that of excessive ex-"citement." It is admitted, that, in this case, the muscles of voluntary motion, the stomach and other portions of the alimentary canal, and perhaps other parts of the system, are exhausted of their excitability, and extremely weak; but, at the same time, the arterial, venous, glandular, and absorbent systems, are subjected to the most excessive and alarming action. This distinction, unattended to by Dr. Brown, or the authors of the work before us, we conceive to be most important—that the voluntary muscles and the stomach, &c. may be so weak that the patient cannot move a limb, or retain a particle of food; while, at the same time, the arterial system may be overstrained, convulsed, and lacerated by excessive action. The violence of the disease, in these cases, concentres the excitement and excitability in the vas-

cular system, leaving the other parts of the body deprived of their natural share, and consequently in a state of indirect debility.

Mr. Christie has devised a scheme to illustrate the fundamental principles of the Brunonian system, which appears to be apposite and ingenious.*

The analogy of a fire-place is employed for this purpose. Let the *grate* represent the *human frame*—the *fuel*, the *excitability*—an imaginary *tube*, opening into the grate from behind, and supplying fresh fuel, exhibits the *source* of the excitability—an *air-machine*, consisting of many *tubes*, leading into the grate in front, and conveying air, denotes *stimuli* of different kinds and quantities—and the production of *flame* represents *life*. If some of the air-tubes convey oxygene gas, they will denote the diffusible stimuli—if others convey atmospheric air, these refer to the ordinary and permanent stimuli—and if others again carry impure air, these indicate miasma, contagion, poisons, &c.

Flame, or *fire*, denotes *life—life* is produced by *stimuli*, and continually wastes *excitability*. A large quantity of fuel, and a small fire, point out *direct debility*—a large fire and scanty fuel, *indirect debility*—and a just proportion of both, *good health*.

Great violence of the fire will represent diseases of excessive excitement; but in order to preserve the resemblance with any exactness, it becomes necessary to imagine some connecting power between a violent fire and an increased, preternatural supply of fuel; as certain degrees of diseases of high excitement always extort supplies of excitability preternaturally great, and thus acquire the power of maintaining and increasing their own violence. Ultimately, however, in the progress of such diseases, this extraordinary supply of excitability will fail; this violence of stimulation will exhaust the whole of it, and the flame of life be thereby extinguished.

But Dr. Brown and his followers do not seem to have considered, that the grate might be so constituted, as to be destroyed by the violence of the fire; as the human body may suffer organic derangement and destruction by excess of excitement. The simple and uniform material constituting the grate, contrasted with the complexity, intricacy, and delicacy of organization discoverable in the animal system, and the consequent liableness to different states of morbid action in different parts, is also another ground of the oversight and mistakes of the Brunonian theory. One department of an animal body may invite and concentre excitement of the most furious kind, while others are torpid from indirect debility. The stimulants applied to rouze the torpid parts miss their aim, and expend all their force in overstraining and

* Beddoes's Preface to Brown's Elements, p. 129.

destroying the vascular organization. A more natural management seems to consist in closing some of the air-tubes, and thereby reducing the fire within safer bounds; or, in other words, to withdraw a proper quantity of stimulus, and leave the system to regain its proper equipoise.

The general principles entertained by our authors are also applied to local diseases. Considering local inflammation not as a disease of excessive excitement, but of indirect debility, they contend for the propriety of stimulant applications. Among other local inflammations, this doctrine is extended to burns and scalds. A few facts, out of those constantly passing before our eyes, will be sufficient to overthrow all the reasoning on this point. The recollection of every practitioner in the United States will, no doubt, supply additional instances, though perhaps none more remarkable than the following. The lady of the Commandant on Governor's Island, the last winter, inadvertently burned one of her fingers, the whole length, against an iron. The surgeon of the garrison, who was present, immediately caused it to be placed in cold water, which was frequently supplied, for a few hours, with the entire cure of the burn. In the same season, some of the people of the garrison were employed in killing hogs; and a large quantity of hot water was prepared, as usual, to scald them. By accident, a pailful of this scalding water was overthrown on the foot of a soldier. Cold water was immediately dashed upon it, and frequently renewed for half an hour, when he was able to proceed with his business. Many years ago [one of the Editors of the Repository received the facts from the persons concerned] two brothers, apprentices to a hatter, were employed in taking new hats from a boiler, and rinsing them out in a very large tub of cold water. Some dispute arising, one of them lifted the other by his arms, and seated him directly in the boiler; but being instantly struck with terror at what he had done, without loosing his hold, he again lifted him from the boiler, and seated him in the tub of cold water. The youth who had been thus hurried through these extremes of temperature, had on a pair of wide linen trowsers, and received no other injury than a narrow blister, which was formed directly under the waistband, and encircled his body.

In order to recapitulate and condense the reasoning employed on this intricate subject, which we cannot but think very important in its influence on the practice of medicine; we repeat our dissent from Dr. Brown's unqualified doctrine of *treating diseases of indirect debility by stimulants;* and the still more extraordinary doctrine of the work now under review, *that diseases of excessive excitement cannot exist, and that such as have been so considered are to be treated by stimulants,*—for the following reasons.

1. Because, under the mask of great indirect debility in the muscles of voluntary motion, in the alimentary canal, and perhaps in some other parts of the body, violent and destructive excitement may exist in the vascular, and especially in the arterial system. And, to relieve the debility, at the expence of aggravating the excitement, if it were even practicable, would be to sacrifice the vascular system for the sake of invigorating the locomotive muscles and the alimentary canal.

2. Because Dr. Brown and our authors do not appear to advert to the co-existent circumstances of copious production and waste of excitability, when any extensive or important department of the system is violently excited by disease. And this two-fold operation probably proceeds furthest when inflammation, or some other local derangement, is interposed; but the waste eventually much exceeds the production, which explains the universal debility immediately succeeding the solution of all violent acute diseases.

3. Because, when any extensive and important part of the system, as, for example, the vascular, is excessively excited, whatever stimulant remedies may be applied to relieve the deceitful debility of other parts, so far from relieving it, they will be in hazard of directly adding the sum of their stimulus to the stimulus of the morbid cause, and thereby producing an aggregate of the most violent and fatal excitement.

4. Because, even if we suppose the excitement of the most excited parts of a diseased body to be so moderate, that some stimulant remedies may be admissible and necessary, still the *powerful stimuli*, recommended by Dr. Brown, must be hurtful; for remedies of such force, though they increase excitement, and produce excitability at the same time, will always occasion much useless motion, and thereby the waste of excitability will always eventually preponderate the production of it, and the system become consequently more exhausted.

These mistakes of Dr. Brown and his followers, if they be really so great as appears to us, ought to be corrected. We think them as repugnant to experience as unfounded in principle. It is well known, that many physicians have long conformed their practice to these doctrines, and, to the present moment, hold the truth of them to be incontrovertible. With what pernicious effects principles like these must approach the bed of sickness, we shall not venture to inquire. The history of the abuses of stimulants would form, perhaps, as dark a page in the annals of medicine, as in those of general society.

The more maturely this subject is considered, the more importance will be attached to it; and with the more propriety will be

adopted and applied to medicine, the sage advice so fatally forgotten by the rash, inexperienced, and ill-fated Phæton,

Parce, puer, stimulis, & fortiter utere loris.

The unbecoming and undeserved censure, which the authors of this work have cast on the Zoonomia, must not be passed over in silence. Individual complaints, that a system is deficient in method, confused, and unintelligible, amount to but little. Before we admit them to be well-founded, we must inquire for the specific form of the charge. Such is the deplorable ignorance of some of the Tartarian tribes under the dominion of Russia, as we are told, that they cannot enumerate beyond three. That a savage of these hordes should find the tables and reasonings of Euler and of Newton confused and unintelligible, could certainly not be admitted as evidence of the validity of his objections. Such, in fact, is the structure of some minds, that they can form distinct conceptions only of the most naked and simple propositions, for the verification of which the senses may be directly appealed to. The abstract puzzles and confounds them; and every attempt to explain and illustrate, however scientific and ingenious, but adds to their embarrassment, and augments their perplexity. Mole-eyed, they descry a little way before them through the dim glimmering of twilight, but are dazzled and blinded by the full splendour of the glorious day. Without pretending that these remarks are applicable to the authors of the work under consideration, we cannot hesitate to declare our entire dissent from the opinion pronounced by them on the relative merits of the Elements of Medicine and the Zoonomia. To elevate the first above the last, is to prefer the rough, irregular, but masterly sketch, struck out by some sudden effort of untutored genius, to a design conceived, by some master, with the boldness of Angelo, and executed with the felicity of Raphael—in which, if all the parts bear not exact proportion to each other, if some minutiæ are neglected, if a light more glowing falls on some particular figure; yet each is in itself entire and perfect, and the whole forms an assemblage of beauty, novelty, and grandeur, on which the long succession of ages pause with wonder and delight.

(To be continued.)

N. B. *When the review of this work was undertaken, we supposed it to have been originally published in this country, from the title and the manner in which the printer's advertisement is expressed; we since have found this was a mistake; but as the work is interesting, it has still been determined to adhere to the first design.*

ART. II. *Observations on the Doctrine of Phlogiston and the Decomposition of Water. Part the Second.* By *Joseph Priestley*, LL. D. F. R. S. &c. &c. Philadelphia. *Dobson.* 1797. 8vo. pp. 38.

NOTWITHSTANDING the answer of Citizen Adet, (see our Review, No. II. p. 225.) to the first publication of Dr. Priestley, (ibid. p. 221.) and the reply of Professor Maclean to the same work, (see our Review, No. III. p. 348.) this antagonist of the antiphlogistians still maintains his ground, and again bids defiance to his philosophical adversaries. He contends that he has not yet been fully and fairly answered, and calls upon his opponents for something more solid and conclusive than they have hitherto advanced; observing, at the same time, that he is not the only person who, at this time, adheres to the doctrine of phlogiston: but that Messrs. Crell, Gmelin, Westrumb, and Meyer in Germany, and his friends of the Lunar Society at Birmingham, still maintain it.

The solution of iron in the vitriolic and marine acids, appears to Dr. Priestley, after all that has been said, to be incapable of explanation upon the antiphlogistic plan; and indeed it must be owned, that some of his objections to their interpretation appear almost, if not quite, insuperable. If they are really capable of being answered, the gentlemen who have undertaken to answer, have to answer over again.

On the constitution of *finery cinder*, the Philosopher of Northumberland considers the explanations of his opponents very incomplete, and far from being satisfactory. And really, when this *peculiar* substance is affirmed to be a mere oxyd of iron, while experiments lead to the conviction of its being something very different, we do not wonder that Dr. Priestley is dissatisfied with the account they have given of it.

Respecting the *calces of mercury*, he yet declares his belief, that inflammable air may be imbibed by any calx of mercury; that the metal is revived by it, and cannot be revived without it; and therefore some element of which inflammable air consists, which no doubt is phlogiston, is a necessary component part of that metal, and therefore, he says, of all other metals also.

Concerning the *composition and decomposition of water*, the same difference in point of fact seems to exist between the parties, as when we reviewed Dr. Priestley's First Part. He affirms, in opposition to the antiphlogistians, that with very pure dephlogisticated air, and a proportion exactly defined of the purest possible inflammable air, he procures drops of a stronger nitrous acid, than can be obtained by means of air less pure. And he denies, that the azotic, or phlogisticated part of the atmosphere, even should

any of this be present, has any thing to do in producing that acid. In this case of contradictory experiments, we suppose that both ourselves and Dr. Priestley must wait until we hear from Mr. Berthollet and the other French chemists, to whom his first treatise was addressed.

We forbear to make any observations on the apparent harshness and acrimony with which this controversy has been conducted between our author and Professor Maclean. Confident of the zeal for science, and the spirit of benevolence which both possess, we have no doubt the exceptionable parts of Mr. Maclean's pamphlet proceeded not from *design to offend*, but partly from *inadvertency* and partly from *warmth of argument*, and that if Dr. Priestley knew the motives, he would not hesitate a moment to excuse him.

Upon taking a view of the whole controversy as well as we are able, it appears to us, there are some phenomena which the antiphlogistic theory cannot explain; and that, therefore, Dr. Priestley has some strong holds, from which it will be difficult, if not impossible, to drive him. On the other hand, the advocates for phlogiston are far from being explicit and definite enough in the meaning of their term, and on that account, seem not perfectly to understand each other, nor to be clearly understood by their opponents.

ART. III. *The Young Chemist's Pocket Companion; connected with a Portable Laboratory, &c. &c.* By *James Woodhouse*, M. D. Professor of Chemistry in the University of Pennsylvania. Philadelphia. *Oswald.* pp. 56. 8vo. 1797.

THE performance before us affords a new proof of the prevalence of a taste for chemical researches in the United States. And it is one of the circumstances of recommendation to the *Young Chemist's Pocket Companion*, that it is intended to advance the knowledge of that science, by facilitating the means of making experiments, and of interpreting and understanding them. So laudable are all attempts of this kind, that we cannot forbear thinking the author has done service to his favourite branch of philosophy, by the present publication, which may induce many persons to make themselves acquainted with the chemical action of bodies, and thus become able experimenters. Elementary and practical essays of this kind, are highly useful for initiating beginners, and we are pleased to find Professor Woodhouse condescend to collect and arrange a series of experiments, calculated to allure the mind along from object to object, and beguile it, as it were, into an acquaintance with the principles of some of the most interesting phenomena of Nature.

The author has prefixed to this work, a catalogue of the substances and apparatus for making experiments, contained in the *portable chest*, connected with it. And the number and variety of these are such as to permit a great number of experiments to be made. A collection of so many chemical preparations, in so compact and handy an arrangement, may be exceedingly useful to almost every person who is fond of these kinds of researches.

The number of detailed experiments which Professor Woodhouse has given, is one hundred; in which he explains the properties of airs or gases, of alkalies, of acids, of earths, and of metals. The explanations are concise and generally correct. At the end of the experiments, is an advertisement of the Professor's lectures, given annually in the University of Pennsylvania.

As the work is intended for those who wish to become practically acquainted with the science of chemistry, we recommend it, and the *Portable Laboratory*, to the students and cultivators of experimental physics; not doubting that the younger class of inquirers will be considerably aided by it, especially if they peruse it, in connection with such systematical works as those of LAVOISIER, FOURCROY, and CHAPTAL.

ART. IV. *An Inaugural Dissertation on Gangrene and Mortification.* By *Francis K. Huger*, &c. Philadelphia. *Ustick.* 1797. pp. 31.

THE first part of this dissertation is employed in exhibiting a detail of the opinions of the ancients, on the subject of gangrene and mortification. After these, we find a view of the principles and practice of Boerhaave, and his Commentator, Van Swieten. The want of precision, in all those writers, in regard to the doctrines of the vital power, and its fluctuating states of accumulation and exhaustion, and consequently to those of the varied effects of stimulants, renders many of their remarks indistinct and unintelligible.

After justly expressing his dissatisfaction with such opinions, our author proceeds to exhibit and to adopt the more correct principles of the late Mr. John Hunter.

He defines gangrene and mortification to be the "total extinction of sensation and action in a part," or, in other words, "the death of such part." And he supposes it to be produced by a disparity arising between the power and action of the affected part. To comprehend perfectly the opinion of Mr. Hunter and our author, on this subject, it will be necessary to recollect, that the "power" of Mr. Hunter corresponds with the "excitability" of Dr. Brown, and the "sensorial power" of Dr. Darwin; and that his "action" agrees

with the " excitement," the " exertion," or the " fibrous contraction" of the last mentioned writers.

Action is divided, by our author, into healthy, disordered, and diseased. *Disordered* action, he states to be an action of restoration, tending to remove or counteract whatever impedes healthy action; but diseased action always tends to destroy the animal machine. The propriety of this distinction between disordered and diseased action, we cannot perceive. Difference in the degrees of force of the noxious cause, and in the state of concomitant circumstances, we are persuaded, produces all the variety observable in morbid action.

According to our author, gangrene and mortification are of two kinds; one without inflammation, and the other preceded by it. The former generally takes place in persons debilitated by previous diseases, by improper modes of living, or in persons advanced in age. The principal object, in this case, should be to impart strength and vigour to the system. Nutritious diet, the Peruvian bark, wine, &c. are here recommended. We are surprized to find the virtues of opium, so highly praised in such cases by Mr. Pott and other eminent surgeons, intirely passed without notice by the author. But the caution given on the authority of Mr. Hunter, against too large doses of the stimulants employed, is, in our opinion, of great importance.

Of the second kind of gangrene and mortification, viz. that preceded by inflammation, there are, according to our author, two species. The first is produced by the action of inflammation, exceeding the powers of the part to support; and the second is the consequence of a specific inflammation. In the former, the proper treatment consists in preserving the balance between the powers and the action. In such cases, all irritating applications are to be avoided, and every exertion made to moderate the action of the part. This may be most speedily accomplished by blood-letting, purging, and other depleting remedies; and by preserving the system in this quiescent state by low diet. When this disease invades the extremities, would not compression of the principal artery of the affected limb be a powerful means of arresting the spread of the gangrene, till a sufficient reduction of the action of the whole system could be obtained? With the depleting and other debilitating remedies, our author mentions the external use of preparations of lead and opium; and seems to think they operate in reducing action on similar ground. But as the lead and opium are chiefly useful, when the application of them *succeeds* the depleting remedies, we expected to find our author referring their mode of operation to different principles. And, indeed, according to the quotation made from Mr. Hunter, he appears to have considered them as acting in a different manner.

The second species of the latter kind of this disease is the consequence of a specific inflammation; which the author directs to be treated by remedies suitable to counteract the peculiar diseased action; or by destroying and separating the contaminated part from the sound.

It seems to have been our author's principal aim, to give a compendious view of Mr. Hunter's doctrine on this subject. We regret that he has not accomplished his purpose with more perspicuity, order and precision.

ART. V. *Fourteen Agricultural Experiments, to ascertain the best Rotation of Crops: addressed to the Philadelphia Agricultural Society.* By *George Logan*, M. D. Philadelphia. *Francis and Robert Bailey.* 1797. 8vo. pp. 41.

THE fourteen experiments, mentioned in the title of this publication, the account of which occupies about one third of the pamphlet, appear to have been suggested by a prize question, proposed by the Philadelphia Agricultural Society; and were "intended to acquire a knowledge of a rotation of crops calculated "to afford,

"First, the greatest number of profitable crops;

"Second, the greatest quantity of fodder to winter cattle;

"Third, the greatest length of time between manuring the same "field—and,

"Fourth, such a variety of crops, as may not interfere with "one another: but, by coming in regular succession, may afford "the farmer and his family the most constant employ."

This knowledge Dr. Logan supposes himself to have acquired, by means of the fourteen experiments related at length, in the first part of his pamphlet; and he concludes the following rotation of crops to be that which is best calculated to answer the purposes just enumerated.

"1. Indian corn. 2. Potatoes and flax. 3. Wheat. 4. Winter barley, and after barley, buck-wheat, with clover and timothy. 5. Clover, two crops for hay. 6. Clover, one crop for "hay and pasture. 7. Pasture. 8. Wheat. 9. Winter barley."

This plan the author recommends on the credit of his own successful experience; and considers as adapted, "within the ability "of one family," to a farm of "one hundred and eighty acres of "land." But for the particulars of his divisions of such a farm, of the proportions for each crop, and of the arguments by which he enforces his opinions, we must refer the reader to the work

itself. It will naturally suggest itself to his mind, that, as the rotation here proposed, is proposed with relation to the State of Pennsylvania more particularly, some variations will be indispensible in the application to other States. Still, the plan will deserve consideration; which we hope it may receive from the intelligent farmer in every part of the United States.

ART. VI. *Sketches on Rotations of Crops, and other Rural Matters. To which are annexed, Intimations on Manufactures; on the Fruits of Agriculture; and on new Sources of Trade, interfering with Products of the United States of America in foreign Markets.* Philadelphia. *Charles Cist.* 1796. 8vo. pp. 76.

THIS appears to be a new and enlarged edition of a pamphlet published some years since, but which we do not remember to have seen much circulated in America. Its contents are multifarious; and that our readers may be enabled to form a better idea of the work, we shall transcribe the several titles of the author.

1. Of the English old Rotation of Crops.
2. English new Rotation of Crops.
3. Comparison between the English old and new Rotations of Crops.
4. Of the American old Rotation of Crops.
5. American Fallow-Crop new Methods; with and without Maize.
6. Clover Seed.
7. Bean Drill.
8. Sowing Wheat on Clover.
9. Of Farm-yard Manure.
10. Cattle Stalls.
11. Barns.
12. Ice Houses.

Then follow Intimations on Manufactures, &c.

The Sketches are illustrated with various plans and tables; many curious and interesting notes are annexed, partly by the author, and partly by an agricultural friend in England; and the various subjects are apparently discussed with great practical skill and good-sense. The *Intimations* form a pleasing part of the publication, and bespeak a mind at once reflecting, patriotic and ingenious.

The author of this very respectable publication, we are informed, is John Beel Bordley, Esq.

ART. VII. *Treatise on the Yellow Fever; shewing its Origin, Cure and Prevention.* By *Joseph Browne.* New-York. *Argus-Office.* 1798. pp. 31. 8vo.

THERE is hardly any point on which medical writers are more agreed, than ascribing much of the epidemic influence of distempers to some chemical alteration in the atmosphere. The attention of physicians, which has of late, in America, been roused to explore the causes of yellow fever, plague and pestilence, has traced these varied forms of sickness, generally, to a vitiated condition of the air which the people breathe. This ancient opinion, on which there are some excellent observations in the works of Hippocrates, has, until very lately, been expressed in terms as general and indefinite as in the time of the Greek physician.

Within a few years, attempts have been made, and, we hope, not without encouragement and success, to analize the atmosphere a little more minutely than had been done before, and to refer morbid phenomena to certain, precise, and known chemical changes in the air. A number of writers have offered the fruits of their speculations and labours to the public, some of whose performances we have noticed in the progress of our work. Mr. Browne is one of those who undertake to shew the exact condition of atmosphere necessary to produce yellow fever, and diseases of a similar nature and type. In the first section of his work, he endeavours to assign the cause of yellow fever, which he makes to consist in heat, and a deficiency of oxygenous air, or, as he calls it, *animal vital air;* or a surplusage of azotic, or, as he terms it, *vegetable vital air.*

If we understand Mr. Browne aright, he considers the atmosphere chiefly a *chemical compound* of these two airs (p. 7.); and "when any portion of atmospheric air comes in contact with any "substance that has a greater affinity with either of its component "parts, than these parts have for each other, a decomposition of "this portion takes place, and a new union is formed." (P. 9.) The blood, passing through the lungs, attracts the animal vital air, or decompounds a portion of atmosphere proportionate to the oxygene absorbed. By this means, this acidifying principle taken in, overcomes and corrects the tendency of animal bodies towards an alkalescent or putrid state.

He seems to consider oxygene as neutralizing blood in the same manner that carbonic acid neutralizes lime; and, of course, "the "blood is less or more acrid, or fit for the purposes of life, as it is "more or less neutralized with animal vital air, which is the basis "of acidity." (P. 11.) Thus it happens, that if the blood is not sufficiently oxygenated, not only itself, but the secretions from it,

become exceedingly alkaline and acrid; particularly the bile, which, being secreted from venous blood, and, consequently, always of an alkaline quality, may occasionally become so acrid, by a deficiency of *animal vital* air to neutralize it and the heat of the season, as to produce all forms of febrile distempers, from fever and ague to plague itself.

In short, whenever there is not oxygene enough to saturate with its acid, that alkaline humour, the bile, yellow fever and its kindred diseases are brought on by the acrimony and putrescency of the liver. In consequence of which Mr. Browne denominates his animal vital air, the "grand corrector of putrescency."

Such is the author's idea of the cause of the disease upon which he treats. Without animadverting much upon the truth or probability of such an account, we should be glad to learn from Mr. Browne the proofs, that the two gases forming the principal part of the atmosphere, are ordinarily in a state of chemical union, as we believe it to be generally understood among men of science, that they are diffused through each other, but not chemically combined. We do not see, as clearly as our author, the alkalescency of the blood, nor, if we could see it, are we satisfied that alkalescency denotes putridity. The analogy of lime and carbonic acid, adopted to explain the operation of oxygene upon blood, and upon bile, and the effects of both, and particularly the latter, when deprived, more or less, of animal vital air, seems to us very unhappily chosen, and calculated directly to mislead the mind. Such remote analogies as these are little adapted to promote the interests of science.

After giving, from books, various accounts of diseases brought on by vapours exhaling from putrefying substances, which Mr. Browne thinks are illustrations of his doctrine of a redundancy of vegetable vital air, he proceeds, in the next place, to treat of the cure of yellow fever. As he thinks too little oxygene in the atmosphere will not acidify the blood enough, and then the bile will be increased in quantity, and become of a more alkaline and acrimonious quality, promoting putrefaction, exciting fever and ague, diarrhœa, dysentery, bilious fever, plague, &c. the primary object of the physician will be to empty the contents of the bowels, and throw into the atmosphere an additional quantity of oxygenous air. Without advising any particular prescription for accomplishing the former, he passes on to give an account of the decomposition of nitre, by means of the sulphuric acid, to accomplish the latter. He also proposes a decomposition of that neutral salt by heat alone, by putting it into a retort, and keeping them in a red heat.

As in the beginning, the fluids are particularly affected, he proposes to diminish their quantity by bleeding in considerable quan-

tities, and to repair their loss, by acescent liquors of a vegetable kind. And as an expedient that possibly might answer in cases where it might be wished that great quantities of vitiated blood could be drawn off, he hints at the practice of transfusion, whereby good sound blood from the veins (he ought to have said the arteries) of an healthy person or some animal, may be poured into the veins of a patient who loses a proportionate quantity of bad blood. He likewise strenuously recommends keeping up the perspiration, but goes into no practical details on the subject, nor tells how it best may be effected. To remove non-respirable air from the patient's chamber or bed, Mr. Browne proposes a condensing machine, of which he has given a figure, called an abstractor, which may be useful. And he judiciously recommends setting a quantity of quick-lime under the beds of persons labouring under yellow fevers, &c.

Lastly, Mr. Browne proceeds to the method of preventing the disorder of which he treats. For this purpose, he recommends cleanliness of persons, houses, streets, and docks. He advises the planting of trees to absorb vegetable vital air, and evolve animal vital air. He urges the importance of a plentiful supply of good fresh water, and affirms the whole river Brunx could be turned from West-Chester county, through the streets of New-York. This is a very important recommendation, and we hope our fellow-citizens will pay attention to it.

To render the constitution as little liable to pestilential attacks as possible, our author is of opinion, and herein we think him very correct, that flesh-meats, and particularly fish, should be avoided as food during the dog-days, as should likewise spirituous liquors; with the exception of beer, cyder, and wine. He cautions against going to houses crowded with people, as theatres, &c. during hot weather; and suggests to proprietors, the hint of decompounding nitre in them at such times.

With some force and much propriety, he inveighs against the wretched and abominable practice of interring the dead in vaults and church-yards, within the city of New-York, and directs that places of interment should be at some distance from a city; and corpses be covered with quick-lime. And he glances with a good deal of significancy at the preposterous method often employed of making vessels on board of which persons have been lately sick, perform quarantine. Mr. Browne's concluding paragraph, is employed on the agitated question of the *contagious* nature of yellow fever, which he does not consider in all cases contagious; yet, in certain cases, approximating so near to it, that it becomes difficult to draw the line. He seems to think there is something in it that looks like contagion, and that it is probable vegetable vital (azotic) air may be absorbed and stir up mischief in the constitution.

We shall just add, these pieces of chemical discussion please us. We hope Mr. Browne will pursue the subject. The field of inquiry is ample, and where there is so much room, we feel desirous he should continue his labours. The septic or azotic part of the atmosphere, and of all substances which contain the basis of vegetable vital air, is peculiarly important, and we hope its history will ere long be thoroughly investigated.

ART. VIII. *A Dissertation (Inaugural) on the Properties and Effects of the Datura Stramonium, or Common Thorn-Apple; and on its Use in Medicine.* By *Samuel Cooper*, &c. Philadelphia. *Samuel H. Smith.* 1797. 8vo. pp. 58.

THE subject of this dissertation is the plant, known, in different parts of the United States, by the various names of Jamestown-weed, French chesnut, stink-weed, and moon-weed, or moon-wort.

Mr. Cooper first delivers the history of the stramonium; next, relates a very considerable number of experiments, made with the direct intention of ascertaining its virtues; then, subjoins observations on the experiments made; and concludes with some facts and remarks on the use of stramonium in medicine. In every part of his essay, he evinces uncommon attention, patience, and fidelity, fertility of reflection, and ingenuity of conjecture. Indeed, we have not often met with an inaugural essay which so fully merits general reading. Notwithstanding, some defects are observable. But these seem rather ascribable to the limited period allowed to the author for this novel inquiry, than to any less excusable cause;—and these imperfections have been acknowledged by himself, with a degree of humility beyond what could fairly be required of him. In the hope that his essay will be widely circulated, and excite others to investigate such parts of the subject as remain to be explored, we shall be less minute in our examination than its importance would otherwise deserve.

Mr. Cooper's experiments were chiefly limited to the effects of the *leaves* of the stramonium. Some facts are adduced by him, principally on the authority of others, relative to the operation of the seeds, &c. From the concurrent testimony which he has reported, there remains no doubt of the highly stimulant powers of this plant; and that, judiciously applied, it may be advantageously added to the magazine of medical agents. The most obvious imperfection in the experiments, is in those which are designed to shew the operation of the expressed juice of the plant on the vascular and nervous systems, and on the various internal

parts of animals. It is difficult to determine, from the entire want of comparative trials (as, for instance, with water), how much of the effects produced are peculiarly attributable to the stramonium.

The XXXVIIth experiment deserves to be quoted at length, as it exhibits a very curious and remarkable fact.

EXPERIMENT XXXVII. (See p. 30.)

"I obtained a dog that laboured under periodical twitchings "or convulsions, which occurred every three or four minutes. "He appeared to be old; his frame was emaciated, his counte- "nance dull, and, when he walked, his steps were slow and irre- "gular. To this dog I gave a scruple of the extract of the leaves, "which was repeated several times. The effects of the medicine "were frequent black stools, a frequent flow of darkish urine, "thirst, languor, and emaciation of the body. But this treatment "did not diminish his convulsions. I now remitted the medicine "for several weeks. During this period he became fatter, and "more lively than I had hitherto seen him. Upon repeating the "medicine in larger doses, similar effects as before, but of a more "violent nature, were produced. His respiration became labori- "ous and slow; and his death soon occurred. Upon opening his "abdomen, a large worm lay naked to the view, except its extreme "parts, which were concealed by the intestines. I was much "astonished, and much delighted, at a discovery so unexpected; "and at once concluded, that the worm had been the cause of con- "vulsion in the dog. It was of a vermilion colour, above a yard "in length, and nearly an inch in circumference. Professor Bar- "ton, so justly celebrated for his profound knowledge of the ob- "jects of nature, is of opinion, that this worm is a new species of "Ascaris. He probably will be induced to describe and arrange "it among the vermes.

"No perforation through the intestines was obvious; they were "full of a yellowish fluid; but not any fluid was found in the ca- "vity of the abdomen. May we not conjecture, that the worm "perforated the intestines upon the first exhibition of the stramo- "nium, which, according to Dr. Rush and Dr. Fowler, is offen- "sive to worms. The external surface of the intestines and sto- "mach were redder than natural. Some parts of the intestines, "and much of the mesentery, appeared to be in a gangrenous "state. A small quantity of water was found in the ventricles of "the brain. These last effects, I think, may, in a great measure, "be attributed to the violent operation of the medicine."

In the course of his observations on the experiments, which he details, Mr. Cooper seems inclined to ascribe to the thorn-apple the power of producing intermittent and remittent fevers, by its

peculiar exhalations. In this opinion we can not concur. Nor do we think that much can be derived in its favour, from the circumstances which he mentions, on the authority of Mr. Heckewelder and Colonel Sargent. The illness of the former, and of General Putnam, may be referred, with greater probability of truth, to the circumstances under which they had lived, previous to that event; and it will be a sufficient reply to the sentiment countenanced by the latter, that the stramonium delights to grow in soils and situations which are known to be unfavourable to health; that it appears to follow man in his migrations, and to his social establishments; and that, though these facts are found to be frequent, yet it does not always happen that the greatest abundance of vegetables of this species produce any bad effects on the health of persons living in their immediate vicinity.

In treating of the medicinal use of the thorn-apple, Mr. Cooper states several interesting cases, of the epileptic and maniacal kind, in which it was administered with some temporary benefit. But, as it was employed in conjunction with other and powerful remedies, it is impossible to form any certain conclusions from the facts adduced. The most important part of the practical information, here presented, is contained in a letter from Dr. John Archer, of Harford-County, Maryland. But, for this, we must refer the reader, as well as for a variety of other valuable information, to the dissertation itself; of which we can not take leave without again bestowing on it our sincerest praise.

ART. IX. *An Inaugural Essay on the Effects of Cold on the Human Body.* By *John Edmonds Stock, &c.* Philadelphia. *Joseph Gales.* 1797. 8vo. pp. 43.

AMONG those who are accustomed to examine, or called upon to decide on the merits of inaugural essays, there must be very few who are unapprized of the nature of their situation, whose duty obliges them to appear in this line of authorship. The pursuits common to students, and the general embarrassments which result from them, each must have, probably, experienced in his turn, and, therefore, be as able to estimate the one, as prepared to compassionate the other. These sentiments, which so naturally suggest themselves to the mind, when reflecting on this subject, should induce men not misled by the affectation of humility to lay aside those needless apologies which, as in many similar productions, form an unpleasing part of the essay before us. Neither is it so generally true, or, if true, so unavoidable, that the student confine himself in his inaugural discourse, to a track

beaten plain by the immemorial passing of physicians. Many fields of medical science, untrodden, or but partially explored, present themselves on all sides, and invite a survey, in which there is ample room to expatiate and observe. In every direction, subjects of experiment multiply themselves; for the investigation of whose history and nature, care, patience, and perseverance, are all the qualifications that seem necessary to be added to the usual attainments which precede graduation. With these, we have seen many useful and original discoveries effected.

Mr. Stock's essay is intended to comprize, first, the principal facts relative to the operation of cold upon the system, in a healthy state; and, secondly, the application of the facts, thus collected, to the regulation of its use as a remedy in a morbid state.

The author's primary intention is accomplished (in a manner more satisfactory for the style in which his narration is clothed, than for the order with which it is conducted), by a miscellaneous assemblage of facts and opinions from various writers; which leave no distinct impression on the mind, further than that the effects of cold are very considerable. A similar imperfection pervades the second part of his essay; which rather tends to direct us in the application of cold, as a remedy, by scattered examples, and heterogeneous opinions of others, than by any simple principle, rationally deduced, and practically applied. Mr. Stock, however, makes great use of the reasonings and authority of his celebrated preceptor, Dr. Rush. Hence, and from his having collected some facts not generally known, and from the number of well-known facts to be met with in the small compass of this essay, it may deserve to be considered as a publication of convenient reference; and as such, merit to be recommended to practitioners not under favourable circumstances for the consultation of numerous authorities.

ART. X. *An Experimental Inquiry into the Properties of Carbonic Acid Gas, or Fixed Air; its Mode of Operation, Use in Diseases, and the most effectual Method of relieving Animals affected by it. Being an Inaugural Thesis.* By *Joseph Johnson, &c.* Philadelphia. *Ustick.* 1797. pp. 50.

THE discoveries made within a few years concerning the constitution and properties of the aëriform fluids, may justly be called the pride of modern philosophy. The diligence, zeal and penetration, which have been exercised on this subject, will reflect lasting credit on many of the inquirers; and the benefits that have already, and are likely still further to accrue to medicine, from these improvements, must give pleasure to every lover of mankind.

The author of this dissertation distributes his observations into three sections. In the first, he treats of *the manner in which Carbonic Acid operates on the animal body.* In the second, he delivers *the method of relieving animals apparently destroyed by Carbonic Acid Gas.* And, in the third, he speaks of *the use of Carbonic Acid in the cure of diseases.*

1. Presuming that the reader is well acquainted with the chemical constitution of carbonic acid gas, our author proceeds to treat of the manner in which it operates on the animal system. Many philosophers had supposed, that this gas destroys life merely by depriving the system of oxygene; but this opinion is opposed by facts leading clearly to a contrary conclusion. The supposition of its acting as a sedative is also overthrown by arguments which firmly establish the stimulant operation.

In order to ascertain the mode in which this substance acts on the living body, the author made a variety of experiments on himself and others. Different quantities of water, more or less strongly impregnated with it, were taken into the stomach; and in this way it operated in a very speedy and sensible manner. Received by injection into the rectum, it produced effects very observable, but less than those taking place in the stomach. When applied to the skin under bed-clothes, and afterwards, in a larger quantity and more concentrated state, by the experimenter entering a brewer's beer-tub, it operated so manifestly as to remove all doubt of its force with respect to the skin. Admitted to the eye, it soon occasioned severe smarting. In a puppy, apparently dead, a small quantity injected through an opening in the pericardium instantly renewed the contraction of the heart. But in no mode of application did the author perceive such sudden and powerful effects as when he inhaled it into his lungs.

When applied in the several modes that have been mentioned, and in moderate quantity, the carbonic acid always produced a greater or less degree of the following effects. It increased the frequency, fulness, and strength of the pulse; it raised the heat of the body; it produced exhilaration of mind; it excited throbbing of the temples; and, when the dose was more considerable, there took place great distension of the head and neck, redness and turgescence of the face, heat, redness and protrusion of the eyes, dimness of sight, and tendency to vertigo. If applied in still greater quantities, the effects become highly deleterious: the breathing is rendered difficult, laborious, and stertorous—the pupils are much dilated—languor and coma come on—convulsive twitchings succeed—the pulsations are weak, slow, and irregular—the motion of the heart begins to fail, and soon entirely ceases.

The similarity of these effects to those arising from excessive quantities of opium, datura stramonium, ardent spirits, and other violent stimulants, will easily be perceived.

The author supposes carbonic acid to prove fatal to animal life, by inducing apoplexy. This he infers from the universal excitement that takes place; from the obvious determination to the brain; from his own sensations of plethora about the head, the turgescence of the neck and face, the distended or protruded state of the eyes, the dilated pupils, the coma, and the laborious and stertorous respiration. He also infers it from the turgid state of the blood-vessels of the brain, and the effusions of bloody serum into the ventricles, in the dissection of animals destroyed by this poison. And, lastly, from the paralytic effects which have been observed to arise from exposure to less degrees of it.

2. In the second section, the author goes on to direct the method of relieving animals apparently destroyed by carbonic acid gas. Believing that death is produced in this case, "by the violent im-" pression of a powerful stimulant on the body, occasioning an " affection of the arterial system, similar to that in the most in-" flammatory state of fever, and a peculiar determination of the " arterial action to the brain;" the author prescribes his remedies on this ground. He orders the jugular vein, or temporal artery, to be opened, a proper quantity of blood to be drawn, and ice, snow, or very cold water, to be applied to the head and to the whole body.

To establish the propriety of this practice, on the ground of experience, he adduces a striking case, thus treated with success in Philadelphia—the effects of the same treatment repeatedly tried on cats subjected to this poison—the experience of the Russians, and of the inhabitants of Siberia, in favour of the same plan—and, finally, the analogy of the successful management of the drunken apoplexy, by plentifully dashing cold water over the head and the whole body.

If arguments were wanting for that purpose, we might, from the success attending this mode of treatment, deduce a powerful objection to Dr. Brown's principle of applying strong stimulants in cases of great indirect debility.

3. The third section is employed in exhibiting the uses of carbonic acid in the cure of diseases. And here he adduces testimony of its efficacy in typhus, in confluent small-pox, in cynanche maligna, in dyspepsia, in the nausea and vomiting of fevers, in scurvy, scrophula, and dropsy. The use of this remedy has also been greatly extolled in phthisis pulmonalis; but so much contradictory testimony is to be found on this subject, that further experience is certainly necessary to adjust a number of doubtful points. In calculous complaints, the efficacy of this remedy deserves to be rated very high; as the evidence in favour of it comes from various sources, and is altogether unquestionable. From its specific operation on the brain, it is reasonable to suppose it would be

very useful in melancholia, and depressions of mind. In worms, there seems to be ground to expect benefit from it, as malted and other fermented liquors are said to destroy them. In obstinate ulcers, scrophulous or scorbutic, in cancer, and in gangrene and mortification, it has obtained a very high character.

We feel pleasure in observing that much useful matter is to be found in this dissertation. The promises of the preface, with respect to novelty and improvement, we apprehend, will scarcely be realized in the perusal. Small faults are, however, always venial, when they are confronted by substantial merit.

ART. XI. *Proceedings of the College of Physicians of Philadelphia, relative to the Prevention of the Introduction and spreading of Contagious Diseases.* Philadelphia. *Dobson.* 1798. 8vo. pp. 37.

WE insert this title principally with the design of informing such of our readers as may be desirous of possessing the transactions of this respectable body of physicians relative to this interesting subject, how their wishes may be gratified. The little pamphlet before us, comprizes all the proceedings of the College, in respect to the importation of diseases, from August 1793, to August 1797, in a very convenient form; and composes an essential part of the medical discussions which have arisen since the first-named period.

ART. XII. *An Inquiry into the Causes of Sterility in both Sexes; with the Method of Cure.* By *James Walker*, M. P. M. S. &c. Philadelphia. *Oswald.* 1797. 8vo. pp. 22.

THIS is a very imperfect and unsatisfactory performance; and, though short, unnecessarily expanded. The mistake, relative to Noah, (p. 17.) reminds us of a question seriously proposed, for forensic disputation, by a collegian, whose incredulity surpassed his memory—"Whether Noah was ever in the whale's "belly?"

METEOROLOGICAL OBSERVATIONS *for January*, 1798, *made by* GARDINER BAKER, *in the Cupola of the Exchange, in the City of* New-York.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. 7 M.	2 E.	Clear.	Cloudy	Barometer observed at Sun-rise.	2 P. M.
1	36	37	E	E	2		29 79	29 59
2	31	37	W	W	1	1	29 47	29 47
3	32	34	N W	W	2		29 62	29 62
4	25	31	N E	N E		2	29 70	29 63
5	32	31	N	N		2	29 22	29 34
6	27	33	N	N	1	1	29 63	29 70
7	21	30	N	N	2		30 4	30 4
8	20	29	N E	E	1	1	30 4	29 90
9	34	39	S W	W	2		29 40	29 31
10	28	36	W	W	2		29 37	29 38
11	15	23	N	N W	2		29 50	29 45
12	20	33	W	S W	2		29 68	29 65
13	28	41	S W	S W	1	1	29 79	29 79
14	30	44	S E	S	1	1	29 87	29 87
15	37	46	S	S		2	29 77	29 70
16	45	51	S W	S W	2		29 40	29 49
17	36	44	W	W	2		29 69	29 77
18	30	34	N W	N W	2		30	30 3
19	15	25	N W	S W	2		30 3	29 81
20	24	32	S W	W	1	1	29 43	29 36
21	33	42	S W	W	2		29 50	29 60
22	34	41	S E	S	1	1	29 57	29 20
23	23	17	N E	N W	1	1	29 18	29 40
24	13	22	W	W	2		29 70	29 68
25	24	35	S W	S W	1	1	29 60	29 47
26	28	34	N E	N E		2	29 43	29 31
27	30	22	N E	N E		2	29 37	29 20
28	16	20	N W	W	2		29 38	29 58
29	17	23	N	E	1	1	29 95	29 95
30	24	31	W	W	1	1	30 2	30
31	30	31	N W	N W	2		29 93	29 93

Results of Meteorological Observations for January, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 27 3 hund.
Do. do. of the do. at 2 P. M. 33 16
Do. do. of the do. for the whole month, 30 9
Greatest monthly range between the 16th and 24th, 38 0
Do. do. in 24 hours, between the 22d and 23d, 24 9
Four days it rained, and but a small quantity has fallen.
Three days it snowed, and about 22 inches have fallen.
Warmest day the 16th. Coldest day the 24th.

METEOROLOGICAL OBSERVATIONS *for February*, 1798.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. 7 M.	E.	Clear.	Cloudy	Barometer observed at Sun-rise.	2 P. M.
1	26	40	W	N W	1	1	29 60	29 57
2	30	44	S W	S W	1	1	29 50	29 30
3	32	39	N W	N W	2		29 44	29 57
4	32	42	S W	S W	1	1	29 34	29 11
5	28	28	N E	N W	1	1	29 29	29 50
6	22	40	S W	S W	1	1	29 53	29 30
7	29	21	N E	N E		2	29 32	29 46
8	0	12	N	N	2		29 93	30
9	3	15	N	N	2		30 4	30 6
10	10	26	N W	S W	2		30	29 91
11	28	34	S	S		2	29 53	29 40
12	30	33	N	N W	1	1	29 50	29 56
13	22	26	N E	N E		2	29 63	29 59
14	26	28	N E	N		2	29 45	29 40
15	25	28	N W	W	2		29 73	29 80
16	21	29	N W	N W	1	1	29 95	30 1
17	19	28	N E	N E	2		30 10	30 13
18	12	24	N	N	2		30 25	30 28
19	14	23	N E	N E	1	1	30 18	30 13
20	32	33	E	E		2	29 85	29 79
21	33	34	N E	N E		2	29 90	29 90
22	34	41	N W	W	1	1	29 52	29 52
23	32	40	W	S	1	1	29 75	29 50
24	33	38	N E	N E		2	29 50	29 52
25	33	36	N E	N		2	29 47	29 39
26	33	37	N W	N W		2	29 46	29 50
27	26	36	N W	N W	2		29 60	29 57
28	26	37	2N	N	2		29 72	29 72

Results of Meteorological Observations for February, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 24 6 hund.
Do. do. of the do. at 2 P. M. 31 8
Do. do. of the do. for the whole month, 27 57
Greatest monthly range between the 2d and 8th, 44 0
Do. do. in 24 hours, between the 8th and 9th, 29 0
Two days it rained, and a small quantity has fallen.
Five days it snowed, and about fifteen inches have fallen.
Warmest day the 2d. Coldest day the 8th.

METEOROLOGICAL OBSERVATIONS *for March*, 1798.

Days of the Mon.	Thermom. observed at Sun-rise.	2 P. M.	Prevail. winds. 6 M.	2 E.	Clear.	Cloudy	Barometer observed at Sun-rise.	2 P. M.
1	28	33	E	E		2	29 80	29 80
2	31	35	E	E		2	29 50	29 27
3	26	33	N W	W		2	29 70	29 72
4	27	40	S W	S W	2		29 70	29 66
5	33	38	W	N W	2		29 85	29 98
6	23	36	N E	N E	2		30 7	30 4
7	27	41	E	N	2		29 71	29 55
8	36	51	S W	S W		2	29 43	29 39
9	27	34	N E	N E		2	29 75	29 58
10	31	54	S W	N E	2		29 43	29 50
11	33	49	E	S		2	29 52	29 14
12	30	37	N W	N W	1	1	29 18	29 37
13	30	41	E	W		2	29 52	29 52
14	36	47	S W	S	1	1	29 53	29 30
15	43	38	S	N W		2	29 24	29 25
16	36	40	N W	N W	2		29 47	29 60
17	30	41	W	W		2	29 83	29 61
18	34	42				2	29 70	29 69
19	33	35	S E	E		2	29 67	29 48
20	39	49	N W	N W		2	29 29	29 29
21	36	38	E	N E		2	29 24	28 61
22	36	44	N W	N W		2	29	29 29
23	34	45	S W	S	2		29 66	29 63
24	40	47	E	E		2	29 43	29 15
25	39	44	S W	S E	1	1	28 93	28 95
26	36	49	N W	W	2		29 22	29 34
27	45	52	N W	N W	1	1	29 50	29 58
28	37	51	E	S E	2		29 89	29 96
29	41	47	E	E		2	29 97	29 97
30	39	62	N E	S	1	1	29 93	29 80
31	51	70	S	S	2		29 76	29 70

Results of Meteorological Observations for March, 1798.

Mean temperature of the Thermometer at sun-rise, deg. 34 4 hund.
Do. do. of the do. at 2 P. M. 43 10
Do. do. of the do. for the whole month, 38 57
Greatest monthly range between the 6th and 31st, 47 0
Do. do. in 24 hours, on the 30th 23 0
Six days it rained, and a large quantity has fallen.
Warmest day the 31st. Coldest day the 6th.

A TABLE *exhibiting the number of Patients received into the New-York Hospital, in each month, their Diseases, and the event of each Case.*

January, 1798.

DISEASES.	Remain. from laſt Month.	Receiv. this Month.	Cured.	Died.	Dif. Dif. and Eloped.	Under Care.
MEDICAL.						
Pneumonia	7	10	4	1		12
Ascites	2	4	1			5
Mania	5	2				7
Dyspepsia	1	1				2
Gonorrhœa	3		3			
Apoplexy	1			1		
Anasarca	3	2		1		4
Catarrh	4	3	2			5
Diarrhœa	2		2			
Rheumatism	11	3	6			8
Syphilis	7	9	6			10
Enteritis	1		1			
Intermit. Fever	2		2			
Amenorrhœa	1		1			
SURGICAL.						
Fracture	2	5				7
Syphilis	10	6	3			13
Sore Legs	13	7	2			18
Frozen Limbs	6	11	4	1	5 by desire.	7
Wound	1	3				4
Ophthalmia	3					3
Contusion	1	1				2
Tumor	1					1
Lumbar Abscess	1			1		
Fistula in Ano	1					1
Burn	1					1

Result for January, 1798.

Remaining from last month,		90
Received this month,		67
		—157
Cured,		37
Died,		5
Discharged by desire,		5
Under care,		110
		—157

February, 1798.

DISEASES.	Remain. from laſt Month.	Receiv. this Month.	Cured.	Died.	Diſ. Diſ. and Eloped.	Under Care.
MEDICAL.						
Rheumatism	8	1	7			2
Syphilis	10	4	6		1 elop.	7
Pneumonia	12	8	5	2		13
Mania	7	1	2			6
Tetanus		1		1		
Ascites	5	1	4			2
Gonorrhœa		1				1
Anasarca	4		2	1		1
Dyspepsia	2					1
Catarrh	5		3			2
Intermit. Fever		1				1
Diarrhœa		2				2
SURGICAL.						
Sore Legs	18	2	3			17
Syphilis	13	1	6			8
Frozen Limbs	7	3	3			7
White Swelling		3				3
Burn	1	1				2
Wound	4	1	3			2
Fracture	7		4			3
Ophthalmia	3		1		1	1
Contusion	2		2			
Tumor	1		1			
Fistula in Ano	1					1

Result for February, 1798.

Remaining from laſt month,	110
Received this month,	31
	141
Cured,	52
Relieved,	1
Died,	4
Diſcharged by deſire,	1
Eloped,	1
Under care,	82
	141

March, 1798.

DISEASES.	Remain. from laſt Month.	Receiv. this Month.	Cured.	Died.	Dif. Dif. and Eloped.	Under Care.
MEDICAL.						
Rheumatism	2	1				3
Syphilis	7	1	2		2	4
Pneumonia	13	3	9			7
Mania	6	1				7
Ascites	2	1			1	2
Gonorrhœa	1	1	2			
Anasarca	1					1
Dyspepsia	1				1 reliev.	1
Catarrh	2	5	4			3
Intermit. Fever	1		1			
Diarrhœa	2		1	1		
Jaundice		1		1		
Debility		2	1			1
Palsy		1				1
SURGICAL.						
Sore Legs	17	4	3		1 dis.	17
Syphilis	8	3	4		1 elop.	6
Frozen Limbs	7	5	2		2	8
White Swelling	3					3
Burn	2		1			1
Wound	2	1			2	1
Fracture	3	3	4			2
Ophthalmia	1	1	1			1
Scrophula		1				1
Fistula in Ano	1					1
Empyema		1				1
Disordered Spine		1				1
Cancer		2				2

Result for March, 1798.

Remaining from last month,		82
Received this month,		39
		—121
Cured,		35
Died,		2
Incurable,		1
Removed to the Alms-House,		1
Discharged disorderly,		1
by desire,		2
Eloped,		4
Under care,		75
		—121

SUMMARY

For January, February, and March, 1798.

There remained under care, of last Year's Patients, January 1, 1798,		90
There have been received, in the three last months,		137
	Total	227

Of these have been cured,	124
relieved,	1
have died,	11
Removed to the Alms-House,	1
have been incurable,	1
have been discharged disorderly,	1
have been discharged by desire,	8
have eloped,	5
There remain under care, April 1st,	75
Total	227

A RETURN *of Patients admitted to the Care of the New-York City Dispensary, from the 1st of January, to the 1st of April, 1798.*

JANUARY.

DISEASES.	No.	Cured.	Relieved.	Died.	Removed to the Hospital.	Result.	
Syphilis	4	4				Received	38
Cough	2	2					—
Pneumonia	4	4				Cured	29
Worms	1	1				Relieved	2
Pulmonary Consumption	2				2 u. care	Hospital	2
Hectic Fever	1	1				Under care	5
Rheumatism	1	1					—38
Concussion	2	2					
Erysipelas	1		1				
Catarrh	5	5					
Small-pox	4	4					
Anasarca	1				1 u. care		
Spitting of Blood	1	1					
Sore Legs	3				1 Hos. 2 u. c.		
Quinsey	1	1					
Abscess	1	1					
Jaundice	1				1 Hos.		
Ophthalmia	1	1					
Fluor Albus	1	1					
Atrophy	1		1				

FEBRUARY.

Wounds	2	2					
Abscess	1				1 Hos.		
Mumps	1	1					
Spitting of Blood	1	1					
Jaundice	2				2 Hos.		
Diarrhœa	2	2					
Indigestion	3	3					
Pulmonary Consumption	1			1			
Burns	1	1					
Fluor Albus	1	1					
Hectic Fever	1				1 u. care		
Catarrhal Fever	3	3					
Herpes	1	1					
Small-pox	1	1					
Rheumatism	2	2					
Anasarca	2	1			1 u. care		

FEBRUARY continued.

DISEASES.	No.	Cured.	Relieved.	Died.	Removed to the Hospital.	Result.
Syphilis	1	1				Received 31
Contusion	1	1				
Hooping Cough	3	3				Cured 25
Costiveness	1	1				Died 1
						Hospital 3
						Und. car. 2—31

MARCH.

Pulmonary Consumption	3		1		1 Hos. 1 u. c.	Received 43
Syphilis	2	2				Cured 40
Rheumatism	3	3				Relieved 1
Erysipelas	3	3				Hospital 1
Catarrhal Fever	7	7				Under Care 1
Worms	1	1				—43
Small-pox	8	8				
Fluor Albus	2	2				
Abscess	2	2				
Head-ach	2	2				
Herpes	1	1				
Mumps	1	1				
Dysentery	1	1				
Indigestion	2	2				
Scald Head	1	1				
Pneumony	3	3				
Colic	1	1				

SUMMARY.

Admitted,	112
Cured,	94
Relieved,	3
Removed to the Hospital,	6
Died,	1
Under care,	8
Total	112

HUGH M'LEAN.

MEDICAL NEWS.

DOMESTIC.

UNDER this head, in our last Number, we laid before the public the sum of our information respecting the *madness* then prevalent, in many parts of the country, among Dogs. Since that time, this disease, though it has disappeared from many places where it was then common, has shewn itself in various other places, in very different and remote districts of New-England. Much mischief has been produced by it. But our intelligence is not sufficiently particular to afford much satisfaction to the inquisitive reader. Such steps, however, have been taken, as lead to an expectation that no material facts will eventually be withheld. In the mean time we shall briefly state such facts as have been communicated to us.

From Rhode-Island we learn that one instance of death, from the bite of a mad dog, has occurred there, with all the symptoms of hydrophobia; and that another person was likely to perish in the same way; and that a yoke of oxen had been destroyed in consequence of the bite of the same dog. A third person had also been bitten by this dog, but had not yet suffered any inconvenience from the accident.

In Berkshire County, Massachusetts, many domestic animals have been bitten by dogs supposed to be mad,—and which were killed in consequence,—but no injury has hitherto happened to the creatures bitten.

In Connecticut the rabies had first shewn itself, in the town of Berlin, (about twelve miles from Hartford) in the beginning of March; though it had vanished from Hartford, and the places originally visited by it. We have not heard whether any serious injuries have been sustained there.

In the neighbouring town of Southington, the following melancholy accident has just occurred from this source. The account is copied from the Connecticut Courant for April 23.

" *Hartford, April* 23, 1797. Died, at Southington, on Sunday, " the 15th of inst. April, Levi Woodruff, aged 43.

" The progress and origin of his disorder will probably be " thought worthy of being recorded.

" He felt himself considerably indisposed on Thursday, was " affected with a pricking pain in his ear, head-ache, &c. On

" Friday he was abroad. At evening, feeling his indisposition in-
" crease, a physician was called in.—From a slight degree of *hy-*
" *drophobia*, the physician was alarmed with an apprehension of
" canine madness; but having never heard, though a near neigh-
" bour, of the patient's having been exposed to be bitten, he sug-
" gested nothing, at that time, of his fears. On the morning of Sa-
" turday he saw him again, and, observing an increase of the same
" symptom, he suggested the idea to the family. It was then re-
" collected by them, that, for a length of time, the patient had ac-
" customed a small dog, belonging to a neighbouring family, to
" lick an ulcerated sore *within* his ear—that four weeks previous
" to that time the dog was put to lick the sore—that the operation
" was more than commonly painful, and that a small breach was
" made in the skin of the ear, by the tongue or teeth of the dog—
" that the next day the dog was affected with symptoms of mad-
" ness, and the day following was killed. No apprehensions of
" mischief were entertained at the time, nor had it been thought
" of after. The physician was now convinced that the disorder
" must have proceeded from the virus infused by the dog; but
" this conviction was obtained at too late a period to admit of an
" effectual application of remedies. Through the whole of Sa-
" turday he was constantly craving water; but was thrown into
" the most violent agitations and horror upon the sight of it.
" Through the night he was very restless. In the morning his dis-
" order increased to an height astonishing to all the spectators.
" He continued in a most distressed condition till sun-set; and
" then expired, in all the anguish which ever attends this most
" terrible of human disorders.

" He appeared to possess a considerable degree of reason through
" the whole scene—was perfectly able to distinguish and speak to
" every acquaintance around him—and was apparently sensible
" that his dissolution was fast approaching.

" A circumstance peculiarly favourable to his friends and at-
" tendants, and to be remembered by them with gratitude, was
" this—that he shewed no disposition, at any time, to do the
" smallest injury or mischief to any person; but was constant in
" expressing the warmest and most benevolent wishes for the wel-
" fare of his family, and of his neighbours."

We shall take leave of this subject, for the present, with inserting an Extract of a Letter from Dr. Mease, of Philadelphia, to Mr. Smith, under date of April 3, 1798.

" Probably you may have seen an account, lately re-published
" in the newspapers, of the use of *vinegar* in the disease produced
" by the bite of a mad dog. The same account was published in
" the year 1792; and as I was then engaged in writing my Inaugu-
" ral Dissertation on that subject, I took pains to ascertain the truth

" of the fact. As the cure by vinegar was said to have been per-
" formed in Friuli, in Italy, I wrote to the Rev. Mr. Hall, Chap-
" lain to the English Factory at Leghorn, and requested him to
" inquire into the circumstance for me; which he very kindly
" did; and, in a letter dated the 29th of January, 1793, informed
" me, that 'the physicians of that place, and of Rome, remem-
' bered to have seen the account published in a Bologna Gazette,
' three or four years before; but as it has never made its regular
' appearance before any medical society in Italy, it does not merit
' attention.' Count Leonissa is the physician who is reported to
" have cured the patient by large draughts of vinegar; and I think
" it probable, if he had been actually successful, he would not
" have omitted to publish the case in some of the European jour-
" nals; especially as he could not have been ignorant of the want
" of system that exists upon the subject of rabies, and that no re-
" medy, uniformly or even partially successful, had before been
" discovered.—As the disease has unfortunately appeared, of late,
" in several instances to the eastward, and as many physicians,
" and others, may be induced to trust to the vinegar, to the neg-
" lect of other more powerful remedies, probably this refutation
" of the reputed success of that acid may tend to save a life, if in-
" serted in your *Repository*."

As epidemics among other animals besides men are so rife at present, we shall need no apology for introducing whatever may illustrate their history. One additional fact has been reported to us relative to the *cat-distemper*. In Connecticut, it has only been observed in the large towns; and has no where, as far as we can learn, been seen in country places. This suggests the inquiry—How far has this been the fact in other States? We wish that the medical philosophers of our country may not disdain this species of investigation.

The disease among *cattle*, of which a very interesting account is given in our last number, by the Rev. Mr. Parsons, has occurred in several other parts of the country.

We learn that the *foxes*, in some parts of Massachusetts and New-Hampshire, have been affected with a disorder, the winter past, which rendered them an easy prey to the hunters. Of the particular symptoms, we have not been able to obtain any correct account.

We are assured also, that *geese*, in some of the Eastern States, have been evidently affected in a singular manner. Many have been seen to seize some object with their bills, and adhere to it till they died.

The concurrence of these facts is curious, and deserves the most attentive observation and research.

Hartford, January 1. As it has been unusually healthy during the year past, we have obtained from the sexton, an account of the deaths which have taken place within the first and second societies of Hartford, in A. D. 1797. These two societies comprise all the town except the society of West-Hartford. The whole number of deaths, from the 1st of January, 1797, to the 1st of January, 1798, is 59, viz.

From 60 years and upwards,	13
Between 60 and 30,	10
Between 10 and 30,	9
Under 10,	27
Total,	59

In A. D. 1794, there died in the same limits,	110
In 1795,	89
In 1796,	75
In 1797,	59

New-Haven, January 4, 1798.

Deaths in New-Haven, A. D. 1797.

January	5	July	2
February	6	August	5
March	6	September	1
April	1	October	3
May	6	November	9
June	8	December	6

Total 58.

Males 29. Females 29. Whites 52. Blacks 6. First Society 14. White-Haven 8. Fair-Haven 10. Episcopal Society 14. Of neither of the above Societies 8. Strangers 4.

Under a year	16	Between	50 & 60 5
Between	1 & 5 6		60—70 4
	5—20 0		70—80 9
	20—30 3		80—90 1
	30—40 5		90—100 3
	40—50 6		

Under 1 and above	60—33
Under 1 and above	70—29
Between 1 and	60—25
Between 1 and	70—29

A common mortality for the city of New-Haven in a year is 66, or one to seventy souls.

Two fifths of the deaths are under five years; two fifths between five and sixty; and one fifth upwards of sixty. The year last past, the number of deaths among aged people, has been above the usual proportion.

The number of our citizens who die abroad is about the same as that of strangers buried in the city.

Albany, March 2, 1798. At a meeting of the Society for the Promotion of Agriculture, Arts, and Manufactures, of the State of New-York, the following gentlemen were elected officers for the ensuing year, viz.

Robert R. Livingston, President.
Ezra L'Hommedieu, Vice-President.
John Taylor, Treasurer.
Samuel L. Mitchill and Benjamin De Witt, Secretaries.

Robert R. Livingston, Simeon De Witt, Samuel L. Mitchill, Stephen Lush, and William S. Johnson, Committee of Publication.

The annual Address, at the commencement of the Session, was delivered by Dr. Mitchill.

A number of respectable gentlemen, from different parts of the State, have since been elected members; and several important communications have already been received, and read before the Society—among which are Sir John Sinclair's Address to the Board of Agriculture of Great-Britain, on the 20th of June, 1797; and a description of the remarkable *salt springs*, in the western part of our State, with an analysis of the waters, and an account of the salt manufactories at present established, by Benjamin De Witt, M. D. of Albany.

To the Citizens of the United States.

In consideration of the general utility that would result from the citizens of the United States being enabled to procure, free from expence, an analysis of any ores or mineral substances, "The Chemical Society of Philadelphia," on the 20th of June, 1797, passed the following resolution:

"Resolved,

"That a committee of five members be appointed, whose busi-"ness it shall be to notify, in the different papers of the United "States, and by circular letters, that they will give an analysis of "all minerals which may be sent them."

In conformity to the above resolution we hereby give notice, that we will analize any mineral which may be sent to us, provided it be forwarded free of expence, and accompanied with an account of the place and situation in which it was found.

COMMITTEE.

Thomas Smith, No. 19, North Fifth-street.
James Woodhouse, 13, Cherry-street.
Samuel Cooper, 178, South Front-street.
Adam Seybert, 191, North Second-street.
John C. Otto, 37, North Fourth-street.

Professor BARTON of Philadelphia, who has lately published a small tract on the Vegetable Materia Medica of our country, is preparing for the press, a work to be intituled "Strictures on the "Arrangement of the Materia Medica, adopted by Dr. Darwin "in his Zoonomia."

Dr. Currie of Philadelphia, whose work on Bilious Fevers, announced in our last number, has since made its appearance, promises a work of considerable extent on the *Yellow Fever.*

January 19, 1798. The *American Philosophical Society* held their annual election of officers on the first Friday of this inst. when the following were duly chosen.

President—the Hon. Thomas Jefferson.

Vice-Presidents—Nicholas Collin, D. D. Dr. Benjamin Rush, and Dr. Caspar Wistar.

Treasurer—Mr. John Vaughan.

Secretaries—Samuel Magaw, D. D. Dr. Adam Seybert, Dr. I C. James, and Mr. Samuel H. Smith.

Curators—Mr. Charles W. Peale, Dr. Benjamin S. Barton, and Mr. Robert Patterson.

Class of Counsellors for three years—Mr. Jonathan B. Smith, Dr. William Currie, William Smith, D. D. and Mr. Jonathan Williams, two years from January, 1798.

The Lancaster German Paper mentions, that on Tuesday, the 11th of January, 1798, between the hours of two and three in the morning, there was felt, in that town and its neighbourhood, a severe shock of an EARTHQUAKE, which continued for several minutes. The shock was accompanied, it is said, with a blaze not unlike the burning of a chimney. To this imperfect account, we have been unable to obtain any additional information.

Dr. Davidge, of Baltimore, has lately published a small work on the Yellow Fever; and we are informed that Dr. Potter, of that city, designs soon to publish a reply to it. We anticipate much pleasure and improvement from the extensive discussions on this important subject, which are now fast spreading through every part of our country.

The following Article is from a Letter, just received, from Dr. Brickell, of Savannah, whose Botanical Communications we shall always be happy to admit.

"I here present you with a description of the JEFFERSONIA, "one among the many anonymous plants which I have found in "Georgia; and which I have named in compliment to Thomas Jef- "ferson, our Vice-President, whose great political and philosophi- "cal talents reflect very high honour on the United States; and "who, to his immense stores of other knowledge, has added the "science of Botany.

"JEFFERSONIA. Pentandria, Monogynia. The calyx be- "low, five short oval imbricated leaves; corolla monophyllous, fun- "nel-shaped, on the receptacle, subpentangular, bearing the fila- "ments near its base, its margin hypocrateriform, divided into "five round dents nearly equal; style filiform, shorter than the "petal, but longer than the stamens; the stigma quadrifid; an- "thers erect, linear, sagittated; fruit two univalved, carinated, po- "lyspermous capsules, coalesced at base, opening on their tops "and contiguous sides, having flat seeds with a marginal wing.

"I have observed one beautiful species, of this genus, which I "have named *Jeffersonia sempervivens*, Evergreen Jeffersonia. It "is a shrub with round polished twining stems, which climb up "on bushes and small trees; the petioles short, opposite; leaves "oblong, narrow, entire, evergreen, acute; flowers axillary, yel- "low, having a sweet odour. The woods are full of this delight- "ful shrub, which is covered with blossoms for many months in "the year."

FOREIGN.

Paris, 25 Vendemiaire, October 16.

ASTRONOMY.—The comet which I discovered the 27th Thermidor, at 10 o'clock, P. M. at the National Observatory, has been seen the 28th at Padua, by M. Taoldo's nephew, and at Leipzick by M. Rudiger; at Viviers, on the 29th, by Citizen Flaugergue; at Vienna, in Austria, by M. Trattinick; and at London by Mr. Walker. It has been also seen at Berlin by M. Bode; at Bremen by Dr. Olbers; at Bern by M. Tralles; at Marseilles by Citizen Blanpain; Citizen Mechain observed it, for several days, near Rhodes.

The comet having passed near the earth, I took care to correct the observations of the parallax.—The elements are calculated according to the analytic method of Citizen Laplace. From my own

observations, and from those of Citizen Messier, I have drawn the following elements:

The instant of the passage of the comet through the *perihelion*, the 21st Messidor, at 2h. 53m. 52s. mean middle time at the Observatory.

Distance perihel. - - - - - - - -			0,52545
Hodus. Ascendeus - - -	329°	16	3511
Perihel. on the orbit - - - -	49	34	44
Inclinat. of the orbit. - - - -	50	35	50

The sense of the motion retrograde.

BOUVARD,
Astronomer of the National Observatory.
[*Courier de l'Europe.*

Paris, 3 *Brumaire*, *October* 24. The following article has appeared in the Journal de Paris

" Citizen Beauchamp, who arrived at Trelifond on the 26th of " June, 1797, returned to Constantinople on the 4th of Septem- " ber. He writes to Lalande, that he surveyed the chief points " of the Black Sea, which the ignorance of the Turks and the " jealousy of the Russians had hitherto covered with a veil. He " has found the latitude of Sinope to be 42 deg. 2 min. instead " of 41 deg. as it was set down in the best charts: so that the " breadth of the Black Sea, believed to be 62 leagues, is only 37. " So considerable an error deserved to be rectified by so zealous " an astronomer. Citizen Beauchamp bestows the greatest enco- " miums on his pupil, Charles Hyacinthe Receveur, who, at the " age of 18, calculates and observes in a surprising manner. They " were to have set out, on the 20th of October, for Bagdat, " from whence they are to go to Mascate, in Arabia, where Citi- " zen Beauchamp has been appointed Consul."

The following Articles of Medical Information are extracted or abridged from the 2d volume of the " Annals of Medicine," which was not received in season for a more copious display of particulars.

A small book, in the Italian language, was published at Vienna in 1797, by Count Berchtold, giving an account of a successful method of cure, in the *plague*, which has been discovered by George Baldwin, Esq. his Britannic Majesty's Agent and Consul-General at Alexandria in Egypt. Mr. Baldwin communicated his plan to the Rev. Lewis de Pavia, Chaplain and Agent to the Hospital called St. Anthony's, at Smyrna; who, after five years' experience, pronounces it to be the most efficacious remedy hitherto made use of for the space of twenty-seven years, that the Hospital has been under his management.

The directions are simply these.—Immediately after a person is

perceived to be infected with the plague, he must be taken into a close room, and over a brazier of hot coals, with a clean sponge dipt in warm olive-oil, his body must be very briskly rubbed all over, for the purpose of producing a profuse sweat. During the friction, sugar and juniper berries must be burnt in the fire, which raise a dense and hot smoke that contributes to the effect.

The friction ought not to be continued more than four minutes, and a pint of oil is enough to be used at each time.

In general, the first rubbing is followed by a very copious perspiration, but should it fail of this effect, the operation may be repeated, first wiping the body with a warm dry cloth; and in order still further to promote perspiration, the patient may take any warm sudorific drink, such as elder-flower tea, &c.

It is not necessary to touch the eyes; and any other tender parts of the body may be rubbed more gently. Every possible precaution must be made use of, to prevent the patient from taking cold, such as keeping covered those parts of the body not directly under the operation; nor must the linen be changed, until the perspiration has entirely subsided. The operation should be repeated once a-day, till evident symptoms of recovery begin to appear.

If there are already tumors on the body, they should be gently and more frequently rubbed, till they appear to be in a state of suppuration, when they may be dressed with the usual plasters.

The operation ought to be begun on the first appearance of the symptoms of the disease; if neglected till the nerves and the mass of blood are affected, or a diarrhœa has commenced, little hopes can be entertained of a cure; but still the patient should not be despaired of, as, by an assiduous application of the means proposed, some few have recovered even after diarrhœa had commenced.

During the first four or five days, the patient must observe a very abstemious diet; the author allows only a small quantity of vermicelli, simply boiled in water. Nor must any thing be taken for the space of thirty or forty days, except very light food; as, he says, an indigestion in any stage of the disorder might be extremely dangerous. He does not allow the use of wine till the expiration of forty days.

There is no instance of a person rubbing the patient having taken the infection. He should previously anoint himself all over with oil, and must avoid receiving the breath of the infected person into his mouth and nostrils. The prevention to be used, in all circumstances, is that of carefully anointing the body, and living upon light and easy digestible food.

One of the most ingenious observations made by Mr. Baldwin, is, that among upwards of a million of inhabitants carried off by the plague, in Upper and Lower Egypt, during the space of four years, he could not discover a single oil-man, or dealer in oil.

Mr. James M'Gregor, surgeon to the 88th regiment, corroborates the statement given by Dr. J. C. Smyth, of the efficacy of the nitrous acid fumigations, in arresting the progress of fevers usually denominated contagious—such as the typhus, &c. The fumigations were extended not only to the Hospital, the clothes and bedding of the sick, but to the barrack-rooms; and the usual means of removal, separation, &c. were employed. The following statement exhibits the progress of the disease, under this new treatment.

From the 17th to the 28th of July, 20 cases appeared; from the 29th to August 4th, 16 cases; from the 5th to the 11th, 10 cases; from the 12th to the 18th, 8 cases; from the 19th to the 25th, 3 cases; from the 26th to the 1st of September, 2 cases; from the 2d to the 8th, 4 cases; and from the 9th to the 15th, one case appeared.

Out of sixty-six patients, only the first died; and though the disease re-appeared about the 20th of October, it was soon vanquished by the same means.

Mr. William Simmons, surgeon at Manchester, in a letter to Dr. Duncan, recommends the use of arsenic—prepared in the manner directed by Dr. Fowler, (in the cure of intermittents) and with similar precautions, for the cure of the hooping-cough—on the credit of three years experience of its salutary effect.

Dr. J. Harness, physician to the British fleet stationed in the Mediterranean in the autumn of 1796, recommends, in very strong terms, the use of the *gastric fluid* of the graminivorous animals, in the cure of very bad ulcers—such as those in scurvy, gangrenous sores in typhus, &c. &c. and adds, that he has known it succeed in more than a hundred instances where sphacelus had occurred.

Mr. Stephen Hammick, jun. one of the Assistant Surgeons to the Royal Hospital at Plymouth, in a Letter to Dr. Garthshore, Physician, London, gives the following Account of the Benefit obtained from the external Use of Hops, in the Cure of large sordid Ulcers.

" Having obtained permission from Dr. Geach, senior surgeon " of this hospital, whose kindness and excellent advice I experience " on every occasion, to make trial of common hops in those wards " which I attend as his assistant, I have now the satisfaction of de- " claring, that, during the last six months, I have seen very good " effects from hops, in poultices and fomentations, applied to ul- " cers of the worst kind, in more than sixty patients, received " into this hospital from the ships of war. Some of the ulcers " proceeded from scurvy, and some from other causes. But " though all of them have been sordid, fœtid, and extensive, yet

" the fœtor has soon been corrected by these applications, and the " ulcers have ceased to spread.

" A large handful of hops is to be boiled with a quart of water, " till a strong decoction be formed. Oat-meal, with lard or oil, " is then to be mixed with the hops and the decoction, till the " poultice becomes of a proper consistence. The poultice is then " applied to the ulcer, without any intervening lint. But, previ- " ously to this application, the ulcers are directed to be well fo- " mented with the decoction. The pain proceeding from the " ulcers is soon alleviated, and the ulcers themselves soon cease " to spread. They become clean, and in a state to be dressed with " lint, or any soft ointment."

Dr. John Wilson, Physician at Spalding, in Lincolnshire, in a Letter to Dr. Duncan, gives him the following Account of the good Effects of the Argentum Nitratum, in Cases of Epilepsy.

" After having tried the various means which are commonly re- " commended in epilepsy, without producing any good effect, I " have lately employed the argentum nitratum, in doses of two " grains and a half, three times a day, with the happiest success. " I am now giving it to a boy of 16, in that dose, without pro- " ducing any other effect on the system than a slight nausea. He " has had no return of fits for ten days past, though they formerly " recurred two or three times during the day. He took no other " medicine whatever, combined with the argentum, as it was " formed into pills with bread-crumbs.

" I have met with some few cases of dropsy, arising from a dis- " eased liver, in which I have employed the succus spissatus ci- " naræ, with the best effects, after many powerful remedies had " failed. It promoted a flow of urine, and induced a gentle " perspiration on the body. The swelling of the legs gradually sub- " sided, and the abdomen soon after became of its natural size. " In two cases where I have employed it, there has not been the " slightest return of the disease."

Dr. Mosman, of Bradford, in Yorkshire, in a letter to Dr. Duncan, gives him an account of a remarkable case, in which epileptic fits were arrested, by extending the jaws, and keeping the teeth asunder.—This expedient was first attempted, with a small piece of wood, to keep the patient (a child) from biting his tongue. The wood was afterwards laid aside, and the jaws kept open by the fingers of an assistant forcibly applied. The fit was instantaneously terminated by this application of force in opening the jaws; and upon frequent recurrence afterwards, was as often terminated in the same manner. The progress of some teeth was supposed to occasion the return of the fits. Scari-

fication of the gum was resorted to, and the fits no more returned.

The following Observations were made by the late Mr. David Macliesh, during the Years 1795 *and* 1796, *while he was Surgeon to the* 57*th Regiment, then in the Island of Corsica.*

" 1. Relapses into paroxysms of tertian intermittent fevers, as far as I have been able to observe them in Corsica, take place, almost universally, at intervals of 8, 14, 21, or 28 days.

" 2. In cases of obstinate tertian and quartan agues, which had resisted Peruvian bark, and every other medicine that occurred to me, even moderate doses of arsenic, I have used opium in substance, with the constant and uniform success of curing every such obstinate case, one quartan alone excepted. The number in which I have made the experiment is considerable. After the usual evacuation by vomiting and purging, I have begun with doses of three or four grains of pure opium, three hours before the expected paroxysm. For the second dose, I gave five or six grains; and I thus gradually augmented it till I reached a dose of twelve grains, than which I have never given any larger. I have in no case found any bad effects from this practice: I have observed it most speedily successful when the Peruvian bark has failed.

" 3. I have used the zincum vitriolatum in the intermittents of Corsica, in considerable doses, and in a great number of cases, with remarkable success. I have also used crude sal ammoniac with a good deal of success.

" 4. I have, in forty-two cases of tertian ague, after the failure of Peruvian bark, and other common remedies, used Dr. Fowler's solution of arsenic, by means of which the greatest part of them were cured. The doses were, at an average, fifteen drops three times a day; but sometimes twenty were given. No bad consequences followed this remedy; which I therefore think an useful one in obstinate intermittents.

Dr. Thomas Garnett, Professor of Physics, in Anderson's Institution, Glasgow, in a Letter to Dr. Duncan, gives him the following Account of the Benefit he has observed from the oxygenated Muriate of Pot-ash, employed as a Medicine.

Dr. Garnett had, for several years, supposed, that when a deficiency of oxygene occurs in the system, that principle might be better supplied by means of the oxygenated muriate of pot-ash, than by any other method. The following case gave him opportunity of subjecting his theory to the test of experiment.

" A lady, aged 33 years, had been for several years affected with symptoms of scurvy. Vegetable acids, the elixir of vitriol,

and the cold bath, had afforded her some imperfect relief.—She was advised to inhale oxygene gas, but that not being done, it was determined to try the effects of the oxygenated muriate of pot-ash. She was directed to take three grains of it, four times a day, in a little water. As this produced no uneasiness, the dose was increased to double that quantity. She soon found the smaller livid spots disappear, and the larger ones become less. The strength became greater than for years; her countenance grew much clearer, and she was able to take a good deal of exercise. Her menstrual discharge, which the disease had rendered very profuse, became more natural in quantity.

"It is well known, that about 75 cubic inches of extremely pure oxygenous gas may be procured from 100 grains of this salt, by means of heat. The oxygene is so loosely attached, that it is disengaged even by the light of the sun. Would not this salt be an useful remedy in typhus?"

Dr. Swediaur, in a late publication, from a variety of arguments, endeavours to render it probable, that mercury, in curing the venereal disease, as a specific and sure remedy for syphilis, acts only on the venereal virus, in virtue of the oxygene which enters the different mercurial preparations and compositions. Among other particulars, Dr. Swediaur mentions, that citizen Alyon, of the military hospital Val de Grace, at Paris, has read to the Society of Medicine, a paper on the anti-venereal and anti-psoric powers of oxygene, which throws much light on this important subject. Mr. Alyon has particularly employed, externally, the super-oxygenated muriate of pot-ash, for the cure of chancres and syphilitic ulcers, and has found the good effects from it, more expeditious and more certain than those of any mercurial preparation.

Dr. Rollo's letter to Dr. Duncan, enclosing the above-mentioned publication of Dr. Swediaur, subjoins, "in the hospital "of Woolwich, we go on with the oxygenated muriate of pot-"ash, in lues venerea, and have every reason to be satisfied with "the general results. As yet, we have not detected a single in-"stance of relapse."

Mr. Bell, author of the System of Surgery, &c. has lately published a new edition of his Treatise on the Gonorrhœa and Lues. In this new edition, Mr. Bell opposes his testimony to that of many other gentlemen, respecting the anti-syphilitic powers of the *nitric acid*. In every case in which he has tried it, it has failed; and he now believes it to be wholly useless. He accounts for the apparent success with which its use has been attended in the hands of others, by supposing that the ulcers, &c. have disappeared

during its exhibition, not from any efficacy in the acid, but from certain causes not very well understood, which, he says, sometimes occasion their disappearance, and even the disappearance of buboes, whether any remedies are administered or not. Mr. Bell thinks the nitric acid, for external and internal purposes, no better than any other acid.

Among the medical papers which appear in this volume, are inserted letters from Mr. George Kellie, a navy surgeon, to his father, a surgeon at Leith, relative to the anti-syphilitic powers of the nitric acid. They contain the histories of five cases, treated with this medicine. The first and second were of *chancres*, and the third of a *bubo*, and were completely cured. The fourth was a constitutional affection of long standing, together with a chancre. The last was cured, but the first resisted both the acid and mercury; and the event of the case does not appear. The fifth case is also incomplete. The acid appears to have had every good effect that could be expected from it.

In this volume of the Annals of Medicine, we also find an analysis of the reports on nitrous acid, of which our readers will remember we gave some account in our Number II. and from which we inserted several cases in Number III. The remainder of the information contained in Dr. Beddoes's publication, is not so unequivocally in favour of the acid, as that which we have already communicated. Mr. Baynton reports two cases in which the acid succeeded, after the failure of mercury; one where, under similar circumstances, the patient's health was improved, though the venereal symptoms were not alleviated; and one wherein the acid produced no curative effect. Three cases follow, by Mr. Bowels of Bristol, in which the nitric acid effected no beneficial change. A Letter from Dr. Girdlestone of Yarmouth, informs Dr. Beddoes that the writer had seen no cures produced by the remedy; but that it often increased the disease. Mercurials exhibited in succession, manifested good effects with more than usual rapidity. Dr. Rutherford of Edinburgh, reports that the acid, in his trials, has had various effects: sometimes failing altogether, and sometimes producing the most sudden and happy cures; and that, in some cases where both mercury and the acid had failed, when separately administered, their union has completely obviated the disease. Some additional proofs of the curative powers of this medicine are furnished by Dr. Geach and Mr. Hammick.

The work of Mr. Cruikshank, also mentioned in our Number II. relative to the Nitric Acid, &c. as remedies in Syphilis, is also noticed by the publishers of the Annals of Medicine. Mr. Cruik-

shank made trials of the nitric, the oxygenated muriatic, and the citric acids, and the oxygenated muriate of pot-ash. First, four cases are reported of cures made by the nitric acid; these are succeeded by the same number of cases in which the oxygenated muriatic acid was successful in producing cures; three cases follow, with the like event from the use of the citric acid; and the account is concluded with the relation of six cases in which the oxygenated muriate of pot-ash effected cures. The quality in which the four several remedies here tried resemble each other, is in the quantity of loosely-combined oxygene which they contain, and to which Mr. Cruikshank attributes the curative effects. He, however, differs from many others, in referring the cure, not to the neutralization of the syphilitic virus by the oxygene, but to a new action or disease, supposed to be excited in the system by the oxygene, with which the syphilitic action is unable to contend, and by which it is conquered and superseded.

Such is the amount of the information contained in this work, respecting the powers of the new remedies in the treatment of Syphilis; and we can not help thinking, that enough has been done to render it certain that, in many cases, they possess extraordinary efficacy, and merit a decided preference to mercurials. At the same time, many interesting points remain yet to be cleared up; and while any doubt remains, it is much to be wished that the practitioners of the United States, whose situations permit it, would unite with the faculty in foreign countries in this important investigation, and throw into the common stock the treasure of their experience. In this case, we should hope that the now established circulation of the Repository would point it out to them as an eligible medium of public communication; and to this end, we earnestly invite the practitioners in every part of our country to institute trials, and to favour us with the results.

CORRESPONDENCE.

WE have received a lengthy letter from Dr. Felix Paſcalis Ouvière—(of whoſe Medico-Chemical Diſſertation, &c. our readers will remember, we gave ſome account in our No. I.)—expreſſive of his diſſatisfaction with our judgment of his work. The firſt part of his letter, conſiſting of counſel reſpecting the method incumbent on Reviewers, in our ſituation, to purſue, we are conſtrained to omit, as unlikely to advance his intereſts, or the improvement of our ſubſcribers. Such parts as apply more particularly to the *Review* in queſtion, we cheerfully inſert, without comment. The public muſt determine between Dr. Ouvière and us.

" You requeſt me, firſt, to conſider whether aqueous gas can be formed under the 80th degree of Reaumur (212 of Fahrenheit). I muſt previouſly obſerve, that the denomination of aqueous gas which I make uſe of, could not but improperly be replaced by that of *ſteam*, as you call it, which, according to the beſt dictionaries of your language, ſignifies the 'ſmoke or vapour of any thing moiſt and hot'—(Walker's Dict.). This word, familiar and neceſſary in any mechanic uſe or domeſtic circumſtance of life, is by far inſufficient to expreſs all the ſcientifical meaning of aqueous gas, which, on the authority of Macquer, Prieſtley, Hales, Vanhelmont, Fourcroy, Lavoiſier, and Chaptal, are the only adapted words to ſignify any aeriform, expanded and volatile ſubſtance, reſulting from any kind of fermentation, more or leſs charged with particles diſengaged from the matters it proceeds from. —The aqueous gas, formed by the blood or by the human body, is ſometimes very inflammable, and dangerous to life. It has, beſides, many other properties, which you are, no doubt, acquainted with. In my diſſertation I conſidered none of its component parts, except the aqueous particles, becauſe, in the animal fluids, the loſs of one only of their primitive ſubſtances might be ſufficient to cauſe decompoſition, and becauſe all the component parts of the blood are not yet exactly aſcertained.

" To anſwer, now, to your firſt query, I cannot do better than to mention a little table, which you will find in Fourcroy's Lectures on Chemiſtry and Natural Hiſtory, chap. v. It proves not only that an aqueous gas may be formed under the 80th degree of Reaumur, but that heat from 5 to 10 excites putrefaction, vegetation, and ſlow evaporation; from 15 to 20, it accelerates putrefaction, vinous fermentation; from 25 to 30, it dries up plants and vegetables of any kind; at 45, it diſengages eſſential oil from corrupted animal ſubſtances; and, at 80, it is the ſecond degree of ebullition, in which water muſt RAPIDLY become an elaſtic vapour or a gas, &c. The copious and inſenſible perſpiration diſcovered, and, long ago, aſcertained by Sanctorius, the ſubtile gas thrown out from the lungs in breathing, which our eyes can perceive in certain conditions of the atmoſphere, were, Gentlemen, ſufficient proofs that the loweſt degree of heat in the animal fluids excited the formation of a gas; which will afterwards be copious at the expence of life, according to the increaſed heat of the atmoſphere; and as we have, in

fact, a scale of a thousand affections, experienced by the application of heat on the body, under 80 of Reaumur, your query is quite useless, and has not the character of an objection. The three or four following questions, derived from the first, are, of course, involved in the same predicament. That other of 'the temperature of the vital parts being always the same, at all seasons of the year,' does not give a better induction against the formation of an aqueous gas, by the excess of heat, than it would make us believe that our vital parts, with their temperature, could not be injured by the application of boiling water, of a red-hot iron, or of ice.

"My second dissertation, on the best antimonial preparations for the use of medicine, is also unfavourably mentioned in your Repository. This had no theory to *refute;* you notice, however, 'my more imperfect form of the 'common accounts of the history and preparations of antimony, than those 'found in modern books of chemistry.' Such perfect accounts were not wanted by my querists. My task was to compare all the chemical preparations of antimony, both ancient and modern, in their virtual properties: this I performed in five or six pages; and could not, indeed, fix their attention upon any other preparation but the tartar emetic (antimonated tartrite of pot-ash), and the kermes mineral (red sulphurated oxyd of antimony). Your reflection, that to this last I shew 'the partiality very commonly pos-'sessed by physicians for a favourite remedy,' supposes, that all that I said about it did not altogether strike you with conviction. You should have given a few words in proof, if possible, to put truth and correctness on your side."

DOCTOR William Currie, of Philadelphia, has addressed a letter to the Editors of the Repository, in which he considers himself improperly treated by some personal observations of Dr. Seaman. (See Med. Rep. No. III. p. 315.) The Editors are sorry to find that a misunderstanding of this sort has arisen; but, at the same time, they are gratified to observe that Dr. Currie, yielding to the suggestion of the inutility and progressive irritations of personal dispute, and the injury to the Repository resulting from its being employed as the vehicle of individual altercation, has consented to wave all reference to personalities, and to rest his vindication on the ground of fact and argument.

As authority for the assertion, that the Yellow Fever, in the year 1795, was introduced into New-York by the brig Zephyr, Dr. Currie remarks, that "A letter from the Health Committee of New-York to Governor Jay, dated the 8th of September, contains such circumstances respecting the brig Zephyr, as rendered it sufficiently probable that the disease was introduced into New-York by that vessel; and a letter from the Inspectors of the Health Office of Philadelphia, to Governor Mifflin, published in the Federal Gazette of September 24th, contains such particular information on the subject from authentic sources, as, in my opinion, reduced it to a certainty."

Dr. Currie cannot adopt the information said to be given by the Physicians of New-York to their fellow-citizens, viz. "*That, without the aid of putrid effluvia they need have no apprehension of a yellow fever spreading among them;*" and proceeds thus—"But my experience and observations convince me that such information cannot be depended on; for, although the contagion by which the yellow fever is propagated, operates with more certainty, in an atmosphere rendered unsalutary by the exhalations of putrefying vegetable and animal substances, it still possesses the power, though in a less degree, of producing the disease where there is no reason to suspect

any prevalence of ſuch effluvia, provided the air be of a certain temperature, and in a confined ſituation. I had frequent opportunities of ſeeing this verified laſt year, in ſituations entirely excluded from the acceſs of marſh miaſmata or other exhalations from putrid ſubſtances, in high and dry ſituations, in ſmall apartments, and in the cabins of ſhips, from whence the free entrance of the external air was prevented; at a time when floods of rain prevented any exhalations from putrid or putrefying ſubſtances from riſing into the atmoſphere. From theſe facts it appears that heated air, without the aid of putrid exhalations, eſpecially when calm, is ſufficient to render the contagion active and to propagate the diſeaſe from one to another."

"That the diſeaſe was propagated laſt year in Philadelphia by ſpecific contagion, which had no connection with the effluvia from putrefying materials, I am warranted in aſſerting, becauſe the air was preſerved cool and free from ſuch effluvia, by the attention which was paid to the removal of all ſuſpicious ſubſtances, from whence they could ariſe, and from the frequent floods of rain, which waſhed away every impurity, and prevented putrefaction, or, if any putrid effluvia did riſe, they were immediately precipitated to the earth. And that the diſeaſe was propagated by contagion alone, and not by any change in the conſtitution of the atmoſphere, or any miaſmata derived from the ſituation, ſoil, or condition of the city, is indirectly proved from the known facts, that all thoſe who avoided intercourſe with the infected, their houſes, furniture, cloathing, &c. though daily abroad in the open ſtreets, eſcaped the diſeaſe without exception; as well as all the priſoners in the jail and work-houſe, the penſioners in the alms-houſe, and the patients in the hoſpital, from whence all perſons, ſuſpected of infection, were carefully excluded."

"The inhabitants alſo in the weſt and north-weſt parts of the city were exempt, though the ſituation is more level, and the ponds of ſtagnant water more numerous, than in the part of the city where the diſeaſe firſt appeared, and became moſt prevalent. Theſe facts are notorious, and can be atteſted by almoſt every inhabitant of this city."

"In a pamphlet which I publiſhed the beginning of the preſent year, I have attempted to demonſtrate that the yellow fever, which has, at different times, occaſioned ſo much diſtreſs and mortality in the United States of America, differs from the remittent or bilious fevers of hot climates, and not only in degree, but in kind."

END OF VOLUME I.